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Abstracts

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Prospective study of the complication of pulmonary embolism in nephrotic syndrome. *Zhang Youkang, Yu Dongjie, and Wang Haiyan, et al., Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* The present study was performed in 42 patients with nephrotic syndrome and 12 patients with isolated hematuria, infection of the urinary tract or mild proteinuria (<1g/24h) as the control group, by the use of perfusion-ventilation lung scan or perfusion-chest X-ray. The result showed that the incidence of pulmonary embolism (PE) in the nephrotic patients was 33.3% (14/42 cases, the number of involved branches of pulmonary artery≥1), while all patients of the control group were negative. 57.1% of the PE patients (8/14 cases) had two or more than two involved branches of pulmonary artery. Only two PE patients (14.3%, 2/14 cases), with 10 involved branches of pulmonary artery, showed clinical symptoms and physical signs of the lung. The remainder (86%, 12/14 cases) had asymptomatic perfusion defects which involved frequently the low lobes of both right and left lung. The highest incidence of PE was found in membranous nephropathy patients (41.7%, 5/12 cases). This prospective study first demonstrated in China that pulmonary embolism was a common thromboembolic complication in nephrotic patients. A few patients with PE had severe and sudden attacks, so it is very important to diagnose this serious complication of nephrotic syndrome in time and give the patients proper treatment.

Relationship of repeated intravenous albumin infusion to the recurrence and steroid-resistence of idiopathic nephrotic syndrome (INS) in children. *Zou Hequn, Li Changrong, Chen Mingzhen, Zhuo Anhua, Lü Daguang, and Zhang Wanran, Department of Pediatrics, Affiliated Hospital of Guangdong Medical College, Zhanjiang, China.* The aim of this study is to investigate the relationship of repeated intravenous albumin infusion to the recurrence and steroid-resistence of INS. Forty-one children with INS treated with long-term steroids were divided into two groups. The 20 cases in group A received albumin 4.9 ±2.1 grams every other day, for 3~12 times respectively. The 21 cases in group B were controls. The results showed that the values of BUN of the patients increased from 5.6±2.7 mmol/L to 9.4±1.6 mmol/L ($P<0.001$) and no one's serum albumin increased to normal level in group A. It took 21.4±11.6 days to remove the edema in group A, compared with 6.9±2.4 days in group B ($P<0.001$); and it took 34.8±15.8 days to eliminate the proteinuria in group A, compared with 11.4±7.1 days in group B ($P<0.001$). The recurrence rate of nephrotic syndrome in group A (83.3%) was significantly higher than that in group B (14.1%) ($P<0.001$). During the second steroid treatment for patients with relapses, two cases in group A turned up to be steroid-resistent, yet all the cases in group B were markedly sensitive. It is indicated that intravenous albumin given repeatedly may be one of the reasons causing INS relapse and steroid-resistence in children.

The clinical and pathological diagnosis of the glomerular disease in 570 cases of children. *Zhou Zhuliang, Wang Yaping, Wang Jianguo, Han Jingming and Yang Qi, Dept of Nephrology, 281st Hospital of the PLA, Beidaihe, China.* To understand the relationship between clinical and pathological diagnosis of the glomerular disease, the renal biopsies were made in 570 child patients, of whom 351 were boys and the rest girls, with the mean age of 9.1 years (from 4 months to 14 years). The clinical diagnosis was carried out according to the criteria made at the meeting on pediatric renal disease in June 1979. All patients were examined by clinical and laboratory tests including routine light, immunoglourescence (IF), and partial electron microscopy, for renal pathology. Of the 570 cases, 479 were primary nephritis (PN) patients (84.07%), including 102 cases of acute nephritis (68 ENP, 15 MsPGN, 12 IgAN, 6 IgMN, and 1 FP cases), 7 cases of delayed nephritis (1 ENP, 2 MspGN, 3 IgAN, and 1 IgMN cases), 25 cases of chronic nephritis (11 MsPGN, 4 MN, 8 IgAN, 1 IgMN, and 1 FP cases), 37 cases

of asymptomatic proteinuria or hematuria (1 ENP, 13 MaPGN, 1 MCD, 3 ML, 1 MN, 13 IgAN, 3 IgMN, 1 FP and 1 normal renal tissue cases), 2 cases of rapidly progressing glomerulonephritis (both were crescentic glomerulonephritis), 2 cases of orthostatic proteinuria (1 ENP case and 1 MaPGN case), 237 cases of simple nephropathy (7 ENP, 104 MaPGN, 19 MCD, 16 ML, 19 MN, 14 IgAN, 53 IgMN, and 5 FSGS cases) and 67 cases of nephritic nephropathy (9 ENP, 21 MaPGN, 12 MN, 12 IgAN, 7 IgMN, 2 MaPGN, CrGN, and 2 MPGN cases). Among the rest of the 570 cases, there were 88 cases of secondary nephritis (SN), including 78 cases of purpura nephritis (69 MaPGN, 6 ENP, 2 FP, and 1 FSGS cases) and 10 cases of systemic lupus erythematosus (4 MaPGN, 4 DP, 1 focal necrosis and 1 FP cases); 2 cases of hereditary nephritis, including 1 case of mesangial proliferative glomerulonephritis and 1 case of sclerotic nephritis; and 1 case of congenital nephrotic syndrome indicating MaPGN. We concluded that there were 479 PN cases (84.07%), 88 SN cases (15.4%), and 3 cases of congenital and hereditary nephritis (0.53%) in the 570 cases of glomerular disease. Among the PN cases there were 62.6% MaPGN (including 12.9% IgAN and 14.8% IgMN patients), 18.2% ENP, 7.5% MN, 4.2% MCD, 3.97% ML, 1.5% FSGS, 0.84% CrGN, 0.63% FP and 0.42% MPGN cases. Among the SN cases, there were 88.6% HSPN and 11.4% LN patients. Predominating in simple nephropathy, MaPGN covered 72.2% (including 5.9% IgAN and 22.4% IgMN), while MCD covered only 8% of the patients. ML covered 6.8% of the patients, which was evidently lower than in literature data. In nephritic nephropahty, MaPGN covered 59.7% (including 17.9% IgAN and 10.4% IgMN patients), while MPGN covered only 2.98% of the patients, which was evidently lower than that in adults. There were 36 cases of MN, of whom 31 showed HBeAg positive. Its pathology was in accordance with membranous nephropathy related to hepatitis B surface antigen.

The role of immune reactive ACTH in the idiopathic nephrotic syndrome (INS) of children. *Liu Xuehui, Yang Jiyun, Xia Shujun, and Wang Dongmei, Department of Pediatrics, The First School of Clinical Medicine, Beijing Medical University, Beijing* 100034, *China.* The immune system can synthesize a peptide that is found to be similar to pituitary-derived ACTH in respects of biological activity, molecular weight, immunogenic character and amino acid sequence. This peptide is called immune reactive ACTH (ir ACTH). It plays an important role in the communication between the neuroendocrine and immune systems. In order to investigate the role of ir-ACTH in INS, we measured the levels of plasma cortisol, ACTH and ir-ACTH in the supernatant of peripheral blood mononuclear cells (PBMC) in 14 nephrotic patients, using radio-immuno assay (Double Antibody ACTH kit, DPC, the USA). The results showed that the levels of plasma cortisol and ir-ACTH in nephrotic patients were significantly lower than those in the normal controls (135.05 ± 39.97 vs 185.59 ± 94.67 ng/ml and 37.96 ± 21.49 vs 59.55 ± 17.61 pg/ml, respectively, $P < 0.05$), while there was no significant difference in the level of plasma ACTH (9.41 ± 7.29 vs 6.76 ± 7.55 pg/ml, $P > 0.05$). There was a positive correlation between the plasma level of cortisol and the level of ir-ACTH ($r = 0.6462$, $P < 0.05$). These results suggest that there is an abnormality of HPA axis in INS; the decreased level of ir-ACTH in INS may be responsible for the low level of cortisol; and there exists an irregularity of endocrine-immunomodulation in INS.

HLA-DR region gene polymorphism associated with idiopathic nephrotic syndrome. *Zhou Guoping, Guo Yiqing, Zhang Yanzheng, Yang Ying, and Zhang Gongliang, Division of Nephrology, Children's Hospital, Shanghai Medical University, and Department of Immunogenetics, Shanghai Institute of Blood Transfusion, Shanghai, China.* Idiopathic nephrotic syndrome (INS) has been postulated to have an immunogenetic background. The relationship between HLA and the disease has an ethnical difference. Our previous serological studies showed that the INS in Chinese children was associated with HLA antigens. To further determine the association between HLA and INS at the molecular level, we investigated the frequencies of HLA-DRB1 alleles in 26 Chinese children with INS from the Shanghai area and 58 healthy controls from the same area, using polymerase chain reaction (PCR)/sequence-specific oligonucleotide (SSO) probes. HLA-DRB1* 07 was found increased in 38.46% of the patients with INS, compared with only 8.62% of the controls ($Pc = 2.30 \times 10^{-2}$, $RR = 6.63$). A significant increase in HLA-DRB1* 07 was also observed in patients with steroid-sensitive nephrotic syndrome (SSNS) in comparison with the controls (43.48% vs. 8.62%, $Pc = 9.02 \times 10^{-3}$, $RR = 8.15$). The frequent relapses of SSNS were associated with HLA-DRB1* 09 ($Pc = 2.51 \times 10^{-2}$, $RR = 20.77$). The use of SSO genotyping provides an opportunity for refined analysis of INS associated HLA alleles. Our study provides an additional support for the hypothesis that INS has an immunogenetic basis at molecular level.

Observation of the platelet alpha-granule membrane protein in patients with nephrotic syndrome. *Kang Ziqi, Yu Xi-*

aochu, Li Xuewang, Li Fugang, and Wang Zhong, Division of Nephrology, Department of Internal Medicine, Peking Union Medical College Hospital, and Institute of Basic Medical Sciences, Peking Union Medical College, Beijing 100730, *China.* The Platelet Alpha-Granule Membrane protein (GMP-140), TXB2 and 6-Keto-PGF1$_\alpha$ were observed in patients with Nephrotic Syndrome (NS) by radioimmunoassay. The patients were divided into three groups: the treated group composed of 12 cases who were treated with prednisone (0.5 mg/kg) and cyclosporine (5 mg/kg) for 1 month, the untreated group (20 cases) and the control group (40 cases).

The results showed that the number of GMP-140 molecules on the platelet surface was significantly larger in all patients with NS than in the control group ($P<0.01$) and it showed a heavy drop after the treatment ($P<0.01$). The concentration of TXB2 (pg/ml) and 6-Keto-PGF1$_\alpha$(pg/ml) was much higher in all the NS patients than in the control group ($P<0.01$) and the level of 6-Keto-PGF1$_\alpha$ in the treated group showed a marked drop compared with the untreated group while the level of TXB2 showed no significant difference between the two groups ($P>0.05$).

These results proved that GMP-140 on the platelet membrane in patients with NS showed a heavy expression. After treatment, the molecular number of GMP-140 is a specific and sensitive mark of the activation of platelet and thrombosis.

Study on the platelet function in children with idiopathic nephrotic syndrome. *Li Hongye, Sun Fuen, Fang Yingqe, Wang Hua, and Sun Wei, Department of Pediatrics, the First Affiliated Hospital, Henan Medical University, Zhengzhou, China.* In order to study the platelet function in children with idiopathic nephrotic syndrome (NS), we detected the peripheral platelet count、platelet adhesion function and aggregation function in children. Forty-six children with NS formed the NS group (simple NS: 27; nephritic NS: 19) and 31 healthy children with matched age and sex formed the control group. The platelet adhesion function was detected with the glass bead cylinder method. The platelet aggregation rate was detected with SPA-4 multifunctional platelet aggregation testor. Adenosine diphosphate (ADP) and epinephrine were used as the inducers. Compared with those in the control group, the peripheral platelet count, platelet adhesion rate and the maximum aggregation rate of the platelet induced by ADP or epinephrine were significantly increased in the children with simple and nephritic NS ($P<0.05$). In all these parameters there were no significant differences between the children with simple NS and those with nephritic NS ($P>0.05$). The number of cases in the NS group who showed irreversible monophasic and biphasic aggregation curve was significantly larger than that in the control grouup, but the number of cases in the NS group showing reversible monophasic aggregation curve was smaller than that in the control group, as shown by χ^2 test. In the NS group, there was a positive correlation between the maximum aggregation rate of the platelet induced by ADP and the serum cholestrol concentration ($r=0.534$, $P<0.001$), yet a negative correlation between the maximum aggregation rate of the platelet induced by ADP or epinephrine and the serum albumin concentration ($r=-0.5498$, $P<0.001$ and $r=-0.3315$, $P<0.05$, respectively). There was no correlation between the maximum aggregation rate of the platelet induced by epinephrine and the serum cholesterol concentration ($r=0.0485$, $P>0.05$) in the NS group. These results suggest that in idiopathic NS of children there may be an increased number of platelets, and enhanced platelet adhesion function and aggregation function; and that hypercholesteremia and hypoalbuminemia may be the factors which contribute to the platelet hyperaggregation in plasma.

Study of protein metabolism in nephrotic patients treated with Chinese herbs *Li Liying, Yu Hong, Pan Jisheng, and Wang Haiyan, Nephrology Institute, Beijing Medical University, Beijing* 100034, *China.* In our previous ^{15}N-glicine tracer priming protein turnover studies on nephrotic rats, it was found that two Chinese herbs, *Astragali and Angelica* (A&A) with high protein diet could prevent the decrease of serum albumin by markedly increasing the synthesis rate of protein. A further experiment was designed to investigate the role of A&A and high protein intake in the protein dynamics and nitrogen balance in nephrotic patients. The levels of serum total protein (STP), serum albumin (SA), urinary protein loss (UP) and serum cholesterol (Cho), and the index number of protein turnover and nitrogen balance of 7 patients were measured before the treatment and 30 days after the treatment with A&A. The results showed that after the treatment, the patients had significant increases of STP and SA (44.3 ± 5.60 vs 49.7 ± 6.80, $P<0.01$ and 22.6 ± 0.42 vs 29.4 ± 7.40, $P<0.05$, respectively), decreases in UP and Cho (6.54 ± 1.83 vs 4.63 ± 1.33, $P<0.05$ and 9.69 ± 2.31 vs 7.82 ± 1.95, $P<0.05$, respectively) and rises in the pure rate of total protein synthesis (1.06 ± 0.03 vs 1.27 ± 0.12, $P<0.05$). The results comfirmed the conclusion that A&A combined with high protein diet could improve the disordered protein matabolism and raise the level of serum pro-

tein by improving the pure rate of protein synthesis in nephrotic patients.

The role of cyclosporin a in the treatment of refractory nephrotic syndrome *Tao Fengwu, Liao Lütan, and Wu Zhaolong, Department of Nephrology, Zhongshan Hospital, Shanghai Medical University, Shanghai* 200032, *China.* The effects of cyclosporin A (CsA) in 24 cases of refractory nephrotic syndrome (NS) were analyzed. There were 14 cases of idiopathic nephrotic syndrome (INS) and 10 cases of lupus nephrotic syndrome (LNS). The initial oral dosage of CsA usually was 4 mg/kg/day, then the dosage should be gradually reduced after the remission of NS. At last, CsA 0. 5-1 mg/kg/day was maintained for 6 months to 3 years. The results of this study showed that the response rate was 77. 5% in INS patients and 80% in LNS patients. The overall effective rate was 78. 9%. The recurrent rate was 65%. CsA was still effective when the therapy was repeated in the recurrent cases of NS. The adverse reactions of CsA on kidney were minor and reversible. Our data suggest that the therapeutic effects of CsA on NS were significantly related to the pathologic types of NS. The toxicity of CsA on kidney was closely related to the therapeutic dosage rather than the therapeutic courses of CsA. We believe that the administration of CsA, either alone or with corticosteroid, to patients with refractory NS should be small doses and long-term therapy. Therefore the renal side effects could be reduced, the relapse of NS decreased and the long-term effects of CsA on NS improved.

Idiopathic acute renal failure in nephrotic syndrome: an analysis of 10 cases *Zhang Youkang, Jiang Yun, and Wang Haiyan, et al., Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* In this present study, 10 cases of idiopathic acute renal failure (IARF) in nephrotic syndrome (NS) were analysed. Their clinical characteristics were heavy proteinuria and severe edema. Sudden oliguria, urinary osmolarity decrease and increase of Scr and Bun occurred in them without any clear cause. The pathological changes showed normal or near normal glomeruli, diffuse interstitial edema and patching necrosis of tubular cell. The renal functions of all patients were recovered with the therapy of diuretics, prednisone, etc. This result suggests that idiopathic NS associated IARF occurs often in patients with normal or near normal glomeruli (e. g., minimal change disease, or mild mesangial proliferative glomerular nephritis). IARF associated with idiopathic NS was reversible in most patients.

Acute renal failure (ARF) in primary nephrotic syndrome: a report of 22 cases. *Li Xuewang, Liu Tong, and An Hongjun, et al. Division of Nephrology, Department of Medicine, Peking Union Medical College Hospital, Beijing* 100730, *China.* Among 284 adult inpatients with primary nephrotic syndrome treated in the last 10 years (from March 1, 1984 to February 28, 1994), ARF occurred in 22 patients for altogether 23 times, with an incidence of 8. 1%. Eighteen patients with ARF and 88 patients without ARF received percutaneous renal biopsy. The pathologic types in the ARF group included MePGN (10/18), FSGS (4/18), MPGN (2/18), MCNS (1/18) and AIN (1/18). In the group without ARF, they included MePGN (50/88), FSGS (11/88), MPGN (12/88), NM (8/88), MCNS (5/88) and sclerotic nephritis (2/88). There was no statistical difference between the two groups.

Of the 22 cases of ARF, 15 showed heavy edema and/or pleurorrhea and ascites; and 7 had exiting factors which included diarrhea (2), vomiting (3), heavy diuresis (1) and gestrointestinal bleeding (1). In the ARF group, the mean albumin was 1. 79 ± 0. 63g/dl; Scr 4. 79 ± 3. 20; mean systolic pressure 148. 6±25 mmHg; mean diastolic pressure 91. 73±12. 46 and the mean age, 44. 9±13. 9 years. In the group without ARF, the above values were 2. 41±0. 71g/dl, 1. 11±1. 08, 131. 3± 23. 7mmHg, 83. 76±25. 2 and 35. 2±15. 2 years, respectively ($P<0.001$, $P<0.001$, $P<0.002$, $P<0.05$ and $P<0.001$ respectively).

All the ARF patients received prednisone 1 mg/kg/d and cyclosphosphomides. Four cases received a bolut methylprednisonlone puls therapy. Other therapies including solution infusion and diuresis were given to some patients. Only one patient received hemodialysis.

Nineteen cases got absolute remission and in most of them the remission was achieved in the fairst two weeks. The ARF in one case progressed to chronic renal failure 6 months later. Two cases died.

We concluded that nephrotic syndrome associated ARF is not uncommon. The incidence in our group was 8. 1%. The risk factors for ARF in primary nephrotic syndrome is old age, hypertension and albuminemia. In this observation we did not find any relationship between the pathological types of NS and the occurrence of ARF. Most cases of ARF in primary nephrotic syndrome were reversible.

The role of calcium and Vit D agents in the prophylaxis and treatment of calcium metabolism disturbances in children with nephrotic syndrome. *Jin Yu, Zhao Jilin, Xiong Hui, and Lü Yuanxia, Department of Pediatrics, First Teaching Hospital, Beijing Medical University, Beijing* 100034, *China.* To

study the changes of ICa, 25-(OH)D_3 and NcAMP and the effects of routine dosage of calcium gluconate, VitD, active VitD and 1α-(OH)D_3 on the prophylaxis and treatment of calcium metabolism disturbances in children with nephrotic syndrome (NS), we observed 50 patients with normal renal function. The patients were divided into active stage, remission and persistent proteinuria group, and each group was randomly divided into two small groups, one of which was supplied with calcium and VitD and the other was not. The control group consisted of 28 normal children. The serum ICa was measured by calcium selective electrode, and the 25-(OH)D_3 and NcAMP were determined by RIA. The results showed that the levels of serum ICa and 25-(OH)D_3 were lower while NcAMP higher in active stage group, compared with the normal controls. The remission persisted for 3 months, then the concentration of ICa and 25-(OH)D_3 returned to normal. The patients with persistent proteinuria, followed up for 3 to 18 months, showed lower ICa and 25-(OH)D_3 and higher NcAMP persistently as compared with the normal control group. The levels of ICa, 25-(OH)D_3 and NcAMP did not show significant differences between the groups supplied with and without routine dosage of calcium and Vit D. But after 2 months of treatment with active Vit D and 1α-(OH)D_3, the concentration of ICa increased and NcAMP returned to normal. The results indicated that there were obvious metabolic abnormalities of calcium and Vit D in NS children with normal renal function, especially in those with persistent proteinuria. The routine dosage of calcium gluconate and Vit D can not prevent the calcium and Vit D metabolism disturbances, and 1α-(OH)D_3 may have some effect on the treatment of it.

Nephrotic syndrom complicated by acute renal failure: a report of 12 cases. *Wu Peter, and Shen Changfu, Department of Medicine, Zhangzhou Municipal Hospital, Zhangzhou, Fujian Province, China.* Nephrotic syndrom (NS) complicated by acute renal failure (ARF) is not often reported in the literature in China. Altogether 136 cases of NS were treated in our hospital from January 1992 to December 1993, 12 of whom (8.8%) had the complication of ARF. The 12 cases included 7 male and 5 female patients, whose ages ranged from 13 to 50 years with an average age of 31 years. All cases were in accordance with the diagnostic criteria of NS and ARF, and secondary nephrosis cases were completely ruled out. Seven cases received hemodialysis (8 times for one case on average). Five cases were treated with intravenous injection of furosemide, small dose of dopamin, phentolamine, large dose of inosine, and albumin or blood plasma, etc. The renal function was fully recovered in 11 cases (91%). The remaining case left the hospital despite our persuasion. Prednison therapy followed the improvement. One case had been treated with methylprednisolone intravenously for 3 days (1.0/d), followed by oral administration of prednison. Four cases were treated with tripterygium wilfordii. Eight cases of NS got complete remission (CR) and 4 got partial remission (PR). Nine cases are still in follow-up. Complications of NS include hyperlipemia, arteriosclererosis, infection, thrombusis, etc.. Among them, ARF is the most serious one, and much attention should be attached to it. Clinically, when the patients with NS suddenly develop oliguria, anuria, increase of serum creatinine, or decrease of creatinine clearance rate, the diagnosis of ARF is easy to be made. In the course of NS, ARF may occur at any stage and even be presented as primary symptom. In this group, two cases were sent to the hospital for ARF. This is in accordance with the literature. There are a lot of causes of NS associated ARF. The most important ones are the change of blood rheology, interstitial edema, proteinuria cast blocking renal tubule and vasoconstriction. In this series, 2 cases were caused by the use of gentamycine, 6 by heavy edema, 2 by pneumonia, 1 by gastroenteritis and 1 by unclear reason. NS associated ARF is reversible in most cases. Favourable prognosis in our series is probably due to young age and proper and timely treatment.

Expression of PCNA in the renal tissues from patients with IgA nephropathy. *Li Chengjin, Ye Rengao, Jiang Tang, and Guan Weiming, National Institute of Kidney, First Affiliated Hospital, Sun Yat-Sen University of Medical Sciences, Guangzhou, China.* To clarify the relationship between renal cellular proliferation indices and the degree of renal lesion, the paraffin-embedded tissue sections from 20 patients with IgA nephropathy were examined by the use of immunohistochemical staining (LSAB method) with anti-proliferating cell nuclear antigen monoclonal antibody (Clon PC10). In 6 sections used as controls, $PCNA^+$ cells were occasionally found in tubules but not in glomeruli. In all sections from the patients, $PCNA^+$ cells were found in glomeruli, tubules and interstitium. The mean number of $PCNA^+$ cells was 1.34 ± 0.63 in 1 glomerulus, 42.35 ± 12.39 in every 100 tubular epithelial cells and 12.35 ± 4.20 in every 100 interstitial cells. The number of $PCNA^+$ cells in glomeruli, tubules and interstitium all correlated with the histological grade ($rs' = 0.4718$, $P < 0.05$; $rs' = 0.8157$, $P < 0.001$; and $rs' = 0.7573$, $P < 0.001$, respectively). The clinico-pathylogical study showed that the percentage of $PCNA^+$ cells in tubules correlated with serum creatinine (Scr) ($r =$

0.4653, $P<0.05$) and 24-hour urinary protein ($r=0.6618$, $P<0.02$). A positive correlation was also found between the PCNA$^+$ cell percentage in interstitium and 24-hour urinary protein ($r=0.5007$, $P<0.05$). However, the number of PCNA$^+$ cells per glomerulus did not correlate with Scr and 24-hour urinary protein. In summary, PCNA overexpressed in the renal tissues from patients with IgA nephropathy, and the renal cellular proliferation indices could be useful in histological gradation of the renal damage and prediction of the prognosis of the disease.

Is there relationship between IgA nephropathy (IgAN) and hepatitis B virus? *Wang Niansong, Wu Zhaolong, Liao Lütan, Zhang Yue'e and Guo Muyi, Department of Nephrology, Zhongshan Hospital, and Department of Pathology, Shanghai Medical University, Shanghai, China.* The aim of this study was to clarify the relationship between IgAN and hepatitis B virus (HBV) by comparing the clinical and pathological changes of IgAN in the HBV marker positive group (GI) with those in the HBV marker negative group (GII). From February 1982 to December 1992, IgAN was diagnosed in 85 patients (44 males and 41 females, ranging in age from 12 to 52 years) in our hospital. HBs antigenemia was detected in 15 (17.65%) of them. Of 24 cases, HBeAg was detected in 3, HBeAb in 6, HBcAb in 10, and HBsAb in 1 case. HBV antigens in renal biopsy specimens were examined by immunohistochemical technique and found positive in 26 cases (30.59%). The renal manifestations presenting in the 26 patients included macroscopic hematuria ($n=5$), microscopic hematuria ($n=5$), nephrotic syndrome ($n=4$), asymptomatic proteinuria ($n=5$), acute renal failure ($n=1$), hypertension ($n=3$), etc.. Positive rates of HBsAg and HBcAg in glomeruli were 30.77% (8/26) and 30.77% (8/26), respectively. HBeAg was examined in 17 of the 26 patients and the positive rate of HBeAg in glomeruli was 11.77% (2/17). In total, the positive rate of HBV antigens in glomeruli was 57.14% (18/26). HBV antigens, especially HBcAg, were also found in tubular epithelia and interstitium, the positive rates being 34.62% (9/26) and 7.69% (2/26), respectively. The presence and state of HBV DNA of renal tissues were analyzed in 2 cases by southern blot hybridization technique, and HBV DNA was proved in 1 case. HBV antigen was also found positive in serum and renal tissues. The presence of renal HBV DNA coincided with HBV antigenemia and HBcAg in renal tissues when associated with HBV infection. The comparison of the clinical and pathological changes between GI and GII was as follows:

	GI($n=26$)	GII($n=59$)	P value
Mean arterial pressure (kPa)	12.61±2.75	13.32±1.66	>0.05
Hemoglobin (g/liter)	107.79±11.61	114.44±16.70	<0.05
Creatinine clearance (ml/min/1.73m^2)	76.03±15.48	88.10±38.18	<0.05
Sclerosed glomeruli(%)	24.49±18.51	9.26±6.95	<0.01
Interstitis	20(76.94%)	27(45.76%)	<0.05
Vasculitis	9(34.62%)	11(18.64%)	<0.05

The results suggest that there is a strong association between IgAN and HBV.

Diagnostic value of serum IgA-FN aggregates in patients with IgA nephropathy. *Wei Lin, Zhang Youkang, Wang Haiyan, Hu Lan, and Cai Tianhao, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* IgA nephropathy is one of the most common types of glomerulonephritis in China. Recently, a serum aggregate containing IgA and fibronectin (FN) has been reported to be a marker of IgA nephropathy. In our present study, the levels of serum IgA-FN aggregates were detected with ELISA in patients with IgA nephropathy, non-IgA glomerulonephritis (GN) or non-renal diseases and normal controls. The results showed that the level of IgA-FN aggregate increased markedly in IgA nephropathy. Of 30 patients with IgA nephropathy, 80% reached the positive standard. Only 4% of the 49 patients with other renal diseases and 8% of the 35 normal controls, and none of the 20 randomized hospital patients with non-renal diseases were beyond the positive criteria. These data indicate that the elevation of IgA-FN level in circulation can be a diagnostic marker of IgA nephropathy.

Serum IgA-FN aggregates

	Number of patients	X±SD	Positive rate (%)☆
IgA nephropathy	30	3.90*±1.40	80%
Non-IgA GN	49	1.80△±0.50	4%
Non-renal diseases	20	1.50△±0.20	0%
Normal controls	35	1.55±0.60	8%

*$P<0.01$ vs. other groups; △$P>0.05$ vs. normal controls; ☆ Positive>normal control mean+2SD (i.e. >2.7).

Antiendothelial cell antibody assayed in patients with IgA and non-IgA mesangial proliferative glomerulonephritis. *Chen Xiangmei, Ji Xiaoning and Duan Yonggang, General Hospital of PLA, Beijing, China.* Some studies demonstrated that antiendothelial cell antibody (AECA) is related with some autoimmune diseases. Other studies showed that AECA is related with IgA nephropathy (IgAN). AECA is classified into AECA-IgA and AECA-IgG. The level of AECA was assessed by ELISA in 127 cases of IgAN and 25 cases of non-IgA mesangial proliferative glomerulonephritis (MsPGN). The results showed that the level of AECA-IgA in IgAN and non-IgA MsPGN group was higher than that in the control group (Table). According to our analysis of the AECA level of normal persons, we computed a mean value X and established a normal limit X±2SD. A value is considered to be positive when it is above the limit. The positive rates of AECA-IgA in IgAN and non-IgA MsPGN patients were 9.7% and 8.7% respectively; and those of AECA-IgG in IgAN and non-IgA MsPGN patients were 41.7% and 28% respectively. Conclusion: This study demonstrates that the level of AECA-IgG is high in IgAN and non-IgA MsPGN patients, and it is higher in the former than in the latter.

Table. The result of AECA in IgAN and non-IgA MsPGN (OD)

	AECA-IgA	AECA-IgG
normal	0.381±0.037	0.255±0.019
IgAN	0.463±0.019*	0.417±0.013*
non-IgA MsPGN	0.407±0.046	0.356±0.026*

*$P<0.05$ vs. normal

Role of terminal component of complement C5b-9 in the pathogenesis of experimental IgA nephropathy. *Zhang Yuanzheng, Wang Baolin, and Bai Kemin, Department of Pediatrics, First Hospital, Beijing Medical University, Beijing 100034, China.* In this study, we investigated the deposition of C5b-9 in renal tissue and its relationship with hematuria in the experimental IgA nephropathy (IgAN), by the technique of colloidal gold labelled immune electromicroscopy. Forty-eight male Spraque-Dawley rats weighing from 100 to 150 grams were divided randomly into four groups, i.e. the normal control ($n=15$); the group with IgAN induced by BSA oral immunization ($n=15$); the group with IgAN induced by a tail vein injection of BSA at 1 mg/d for 3 days at week 8 ($n=7$) or at week 16 ($n=8$) following oral immunization; and the CVF treated group ($n=3$). In the last group, the rats received cobra venom factor (CVF) intravenously for depletion of complements at week 16 following the oral immunization for 5 consecutive days, and from the third day of the injection of CVF they were also injected BSA for 3 days. The urinalysis, renal function and serum IgA, IgG and complements were observed during the experiment; and the renal tissues were processed for pathological examinations. The results showed that IgA deposition in renal tissue was found after 16 weeks of BSA oral immunization and the tolerance of mucosa immunization was simultaneously induced, as demonstrated by the decrease of serum IgG level. About 90% of the rats both orally and intravenously immunized developed hematuria and marked depression of serum complement level (CH50). However, no hematuria was found in the normal control, single orally immunized and CVF treated group. The differences were significant. Diffused C5b-9 deposition was noted in the mesangium and capillary walls in the group both orally and intravenously immunized, while no C5b-9 was found to localize in the glomeruli in the other three groups. Our study suggests that C5b-9 has an important role in the inducement of hematuria in IgAN, but the exact mechanism is still veiled.

An ultrastructural study of renal biopsy specimens from children with asymptomatic hematuria (AH). *Wang Zhimin, Wang Yunqin, and Zhou JH, Department of Pediatrics, Tongji Hospital, Tongji Medical University, Wuhan, China.* Light and electron microscopic (LM & EM) examinations of renal biopsy specimens from 24 children with AH were performed in this study. The data obtained (Table) suggested that the incidence of GBM lesion was as high as 75% (18/24). When IgA nephropathy which is a common cause of AH was ruled out, the most likely diagnoses were Alport's Syndrome and TBMD. In diagnosing these GBM diseases, the EM examination played a key role. Therefore we emphasized the importance of EM examination in

the diagnosis of AH in children.

Table. LM & EM findings of renal biopsy

LM		EM				
		Alport's Syn	TBMD	GBM-L	MsPGN	Normal
ML	14	3	5	5		
MsPGN	7	1	1		5	
FGS	2	1		1		
IN	1	1				
Total	24	6	6	6	5	1

ML: minor lesion

IN: interstitial nephritis

TBMD: thin basement membrane disease

GBM-L: non-special GBM lesion

A clinical observation on treatment of glomerular hematuria with ligustrazine. *Zhou Hanyu, Zheng Qiongli, Zhang Ying, Xu Zhen, and Zheng Chenghong, Wuhan First Municipal Hospital, Wuhan, China.* Altogether 113 cases of glomerular hematuria diagnosed under phase microscope were divided into two groups. The 67 cases in the treatment group were given 10% G. S. 250ml plus Ligustrazine (Tetramethylpyrazine) 320mg by intravenous drip once a day for 20 days. Following a 10-day break, the same treatment was given again for 20 days. Thus a complete course of treatment for this group was accomplished. The 46 cases in the control group were given two Tripterygium Wilfordii tablets p. o. 3 times a day for a course of treatment of two months. The total effective rate of the treatment group was 71.64% and that of the control group was 45.65%. The difference between them was significant ($P<0.01$). In order to explore the mechaniam of the treatment, the microcirculation, blood viscosity and filtration index (IF) of the cases in the treatment group were determined both before and after the treatment. The results showed that the microcirculation, blood viscosity and IF were obviously improved. By observing the renal microcirculation in rabbits, we are sure that Ligustrazine can reduce the injury of glomerular submicrostructure in the ischemia and reperfusion test. So the mechanism of treatment of the drug is by descending blood viscosity, improving microcirculation and reducing the injury of renal submicrostructure.

Exacerbation of the endogeneous hyperlipidemia and glomerulosclerosis in rats with adriamycin-induced nephropathy. *Fu Peng, Cui Ruolan, Zhang Xiaoying, and Gong Zhijin, Department of Nephrology, Changhai Hospital, Second Military Medical University, Shanghai, China.* Adriamycin (ADR)-induced nephropathy is characterized by focal and segmental glomerulosclerosis and is supposed to be an ideal model of chronic progressive renal disease. To assess the role of hyperlipidemia in modulating the progression of renal disease, we fed healthy male Wistar rats on normal rodent chow supplemented with 1.5% cholesterol, 0.5% cholic acid and 5% pig tallow (group A), and male Wistar rats who were made nephrotic with a single intravenous injection of ADR on either normal rodent chow (group B) or the hyperlipidemic rodent chow (group C) for 13 weeks. Group A rats had markedly elevated serum cholesterol and triglyceride levels, but histologically only hypercellularity and increased mesangial matrix were present. In group B, urine protein was significantly elevated after a 2-week interval following the injection of ADR and increased progressively throughout the study. Hypercholesterolemia and hypoalbuminemia followed the similar pattern. Group C rats had a significant increment of urine protein excretion in comparison with group B, as shown in the examinations made at all intervals. Compared with group B, group C rats had also significantly larger percentages of glomeruli with glomerulosclerosis/hyalinosis, lipid deposition and mesangial "foam" cells. The EM examination showed more extensive foot process "fusion" and large amount of lipid in glomeruli of group C rats. All the results suggest an important role of hyperlipidemia in the progression of renal disease.

The different effects of LDL from normal human beings and patients with nephrotic syndrom on the proliferation of human mesangial cells (HMC). *Zhang Aihua, and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing 100034, China.* Hyperlipidemia is one of the features of nephrotic syndrome and has been reported to be important in the progress of glomerular lesion. In an attempt to compare the effects of LDL from normal human beings (NHB) with that of LDL from patients with nephrotic syndrom (NS) on the HMC proliferation, this experiment was performed. The results showed that LDL from the NHB and NS patients both had biphastic effects on the HMC proliferation. Low concentration stimulated the proliferation while high concentration inhibited it. At the same low concentration (<200ug/ml), the stimulating effect of LDL from NS patients was stronger than that of LDL from NHB ($P<0.05$). ^{3}H-TdR incorporation in HMC reached the maximum at the concentration of 500ug/ml of LDL from NHB, and it reached the maximum at the concentration of 200ug/ml of LDL from NS. So it is suggested that the effects of LDL from patients with nephrotic syndrom on HMC proliferation are not completely identical with, and may be more active than those of LDL from nor-

mal human beings, which may be related to the different LDL-cholesterol proportion.

Minimally modified low density lipoprotein stimulates the secretion of tumor necrosis factor of mesangial cell. *Ruan Xiongzhong, Kang Ziqi, Li Xuewang, and Zheng Falei, Division of Nephrology, Department of Internal Medicine, Peking Union Medical College Hospital, Beijing* 100730, *China.* Hyperlipidemia is known to be one of the risk factors of progressive glomerulosclerosis. We have previously learned that low density lipoprotein (LDL) can stimulate the proliferation of mesangial cells (MSC) at lower concentration. In order to explore its mechanism, we measured the level of supernatant tumor necrosis factor alpha (TNFα) of cultured MSC. LDL prepared by ultracentrifugation was stored at 4℃ for 6 months in order to make minimally modified LDL(MM-LDL). All studies were performed in rat MSC from the 3-10th passage. The concentration of TNFα from MSC was measured by ELISA. The results showed that the secretion of TNFα from MSC was significantly stimulated by MM LDL at 25 200μg/ml ($P<0.001-0.05$). Within 48 hours, the secretion of TNFα from MSC increased as time went on. The maximum secretion of TNFα from MSC was at the 48th hour ($P<0.05$) when MSC was stimulated by 200μg/ml MM-LDL. The result proves that TNFα plays an important role in MSC proliferation caused by MM-LDL.

Clinical and pathological characteristics of 50 adult cases of MSPGN in Liaoning province. *Zhang Yuxia and Zhou Xijing, Department of Nephrology, First Clinical College, China Medical University, Shenyang, China.* Mesangial proliferative glomerulonephritis (MSPGN) is a common pathological type of glomeruler disorder. In this report, the clinical and pathological characteristics of 50 MSPGN cases were analysed. All the cases were adults in Liaoning province. The result shows that MSPGN has distinct characteristics in the north of China. The morbidity of MSPGN in this area is much higher than that of other types of glomerular disease. The disease is seen mostly in young adults and the Han nationality. The cause of it is unclear and may be related with infection, hypersensitivity and other factors. The morbidity of upper respiratory tract infection is high in this area due to the dry climate and wide range of temperature. This may be one of the explanations of the high incidence of MSPGN in this area. The clinical contrast between non-IgA MSPGN, most of which appear as nephrotic syndrom and some appear as hematuria, and IgA-nephropathy which is characterized by paroxysmal hematuria is remarkable. So the nephrotic syndrom is the main clinical manifestation of MSPGN in the northern area of China, and the corticosteroid treatment is effective in most of the cases. In immunopathology the main IgG deposit was seen in 16 cases and IgM was seen in 11 cases. This is slightly different from the report of Beijing Medical University. It is not clear if the different immunofluorescences result in different pathogenic pathways.

Clinicopathologic analysis of renal disease in the elderly. *Zhang Weiming, Qian Jiaqi, Chu Q, and Zhang Jieyu, Renal Division, Renji Hospital, Shanghai Second Medical University, Shanghai, China.* The clinical and pathologic features of renal disease were investigated in 41 elderly patients corresponding to 3.45% of the 1187 renal biopsys taken in our hospital between January 1985 and July 1994. The patients included 20 males and 21 females, whose ages ranged from 60 to 74 years (mean±SD; 65.2±3.6 years). The renal histological examination revealed 38 patients with glomerular disease. Of them 30 were primary (78.9%), the histological distribution being as follows: 12 FSGS (40.0%), 8 MN (26.7%), 3 MsPGN (10.0%), 2 MCD, 2 IgAN, 2 Crescentic GN and 1 FSPGN. Eight cases were secondary (21.1%), including 3 diabetic nephropathy, 3 amyloid nephropathy, 1 glomerulosclerosis and 1 lupus creacentic nephritis case. The remainded 3 cases included 2 ARF cases and 1 chronic GN patient. The initial clinical manifestations included nephrotic syndrome (NS), nephritic syndrome, urinalysis abnormality, ARF and CRF, the patients with which accounting for 47.4%, 31.6%, 10.5%, 5.3% and 5.3% respectively. It showed that NS was the most common clinical manifestation of glomerular disease in the elderly. Among them MN was the most common, accounting for 42.9%. In our data, diabetic and amyloid nephropathy accounted for 50% of the secondary NS. Fifteen patients were accompanied by hypertension and 14 patients had renal insufficiency, accounting for 39.5% and 36.8%, respectively. Among the patients accompanied by hypertension and renal insufficiency, there were 2 cases of creacentic glomerulonephritis; 12 cases of FSGS, of whom the number of patients with hypertension and renal insufficiently accounted for 50.0% and 33.3%, respectively; 3 cases of diabetic nephropathy and 1 case of glomerulosclerosis.

Clinical and pathological analysis of fibrillaty glomerulopathy (FGP). *Zhang Youkang, Wang Suxia, and Zou Wanzhong, et al., Institute of Nephrology, Beijing Medical*

University, Beijing 100034, *China*. This study first reports 4 cases of FGP in China. All patients had proteinuria, microscopic hematuria and hypertension, and tenal function deteriotation was found in 2 cases. The pathological findings under light microscope showed MPGN (2 cases), MN (1 case) and MsPGN (1 case). Congo-red staining of all the renal specimens was negative. Immunofluoscence (IF) of 3 cases showed granular IgG and C3 deposits in mesangium and glomerular basement membrane (GBM). Electromicroscopy (EM) showed abundant fibrils distributing randomly over mesangium and GBM. The diameter of the fibril was 20.50±0.16 nm. The diagnosis of FGP depends on EM examination. The actual incidence of FGP in China needs further investigation.

Expression of intercellular adhesion molecule-1 and tumor necrosis factor$_\alpha$ in human glomerulonephritis. *Ma Lijun, and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China*. We have used the immunocytochemical analysis and in situ hybridization techniques to investigate the presence and role of intercellular adhesion molecule-1 (I-CAM-1) in normal and diseased kidneys. A total of 64 renal biopsies were classified into three groups according to the degree of cellular proliferation and infiltration in glomerulus. Group A represents non or mild proliferation ($n=38$). Group B represents definite proliferation ($n=21$). Group C represents glomerular sclerosis ($n=5$). The percentage of cases showing increased glomerular ICAM-1 expression in lupus nephritis (90%) was significantly different from that in minimal change disease (20%) ($P<0.05$). Glomerular ICAM-1 expression level correlated with the cellular proliferation and infiltration in glomerulus (B vs. A; $P<0.001$; C vs. B; $P<0.05$). The percentage of cases with tubular ICAM-1 positivity in group B (81.0%) and group C (100%) was greater than that in group A (52.6%). It also correlated with that of interstitial cell infiltration. In situ hybridization of 9 renal biopsies with digoxigenin labelled oligo probe proved the finding of immunocytochemistry. The correlation of I-CAM-1 expression level with tumor necrosis factor-a (TNF-a) expression level in glomerulus ($r'=0.81$), tubular epithelial cells ($r'=0.86$) and interstitial cell infiltration ($r'=0.61$) was also found. Conclusion: Glomerular and tubular ICAM-1 expression level correlate with both the inflammatory degree of glomerulus and TNF-a expression level. Tubular ICAM-1 expression is also associated with interstitial cell infiltration.

Expression of intercellular adhesion molecule-1 and vascular adhesion molecule-1 in the kidneys of patients with lupus nephritis or membranoproliferative glomerulonephritis. *Chen Xiangmei, Xu Qihe, Tang Li, Shi Suozhu, and Yu Lifang, Department of Nephrology, General Hospital of the Chinese PLA, Beijing* 100853, *China*. The techniques of immunohistochemical and computer-imaging analysis were used to detect the expression of intercellular adhesion molecule-1 (ICAM-1) and vascular adhesion molecule-1 (VCAM-1) in the kidneys of 25 patients with lupus nephritis (LN) (type IV) and 15 patients with membranoproliferative glomerulonephritis (MPGN) (type I). ICAM-1 staining showed that ICAM-1 in the glomeruli of MPGN patients (32.59±12.61%) and LN patients (33.72±10.67%) was significantly increased as compared with that in the glomeruli of 12 healthy controls (4.00±1.49%) ($P<0.01$). In the healthy controls, ICAM-1 staining was only slightly positive along glomerular capillary walls, while it was increased both along glomerular capillary walls and in mesangial areas in the LN and MPGN patients. In 6 of the 25 LN patients and 4 of the 15 MPGN patients, ICAM-1 staining on proximal tubule was also positive. Compared with VCAM-1 staining in the glomeruli of 12 healthy controls (2.45±0.65%), VCAM-1 in the glomeruli of MPGN patients (10.36±2.39%) and LN patients (20.91±8.62%) was significantly increased ($P<0.01$). In the healthy controls, VCAM-1 staining was only slightly positive on Boman's capsule epithelial cells, but in LN and MPGN patients VCAM-1 positive staining was found along glomerular capillary walls and in mesangial and cellular crescent areas. ICAM-1 in glomeruli was significantly correlated with glomerular endothelial cell proliferation ($r=0.748$, $P<0.01$), while no correlation was found between ICAM-1 and mesangial cell proliferation, and between VCAM-1 and endothelial or mesangial cell proliferation. Conclusion: ICAM-1 and VCAM-1 expression were both increased in LN and MPGN patients. Both ICAM-1 and VCAM-1 could play important roles in the pathogenesis of LN and MPGN as promoters of inflammatory reactions.

Correlation between the expression of cellular adhesion molecule (CAM) and the renal morphological changes in patients with IgA nephropathy. *Shi Suozhu, Chen Xiangmei, Qin Xiaoxin, and Yu Lifang, Department of Nephrology, General Hospital of PLA, Beijing* 100853, *China*. IgA nephropathy, which is characterized mainly by the widening of glomerular mesangial region, has now been accepted as a clinical syndrome. In recent years, it is considered that the onset of IgA nephropathy is related with the disorder of local immunofunction in kidney. Using indirect immunofluorescence, PAP immunohis-

tochemical technique and computer imaging analysis system, we studied the expression of intercellular adhesion molecule-1 (I-CAM-1) and vascular cell adhesion molecule-1 (VCAM-1) in the kidneys of 47 cases of IgA nephropathy (31 males, 16 females, 16～62 years old). According to the number of mesangial cells (MC) in each area of mesangium, the patients were divided into three groups; MC ⩾4, MC⩾6 and MC⩾8.

Group	N	ICAM-1	VCAM-1
Control	12	4.00±1.49	2.45±0.65
MC⩾4	15	9.52±3.45*	3.21±0.89
MC⩾6	18	16.14±6.35*	6.43±0.14△
MC⩾8	14	21.65±7.84*△	8.41±0.14*△

*$P<0.01$ vs. control; △$P<0.05$ vs. other groups

The findings suggest that there is a relationship between the enhanced expression of CAM in glomeruli and the severity of mesangial hypercellularity and sclerosis. The severer the mesangial cell proliferation, the higher the level of the expression of CAM. Deposits of VCAM-1 and ICAM-1 were mainly along the capillary loops. Therefore we consider that the endothelial cells may be damaged with the proliferation of MC, hence promotes the proliferation and sclerosis of mesangium and deteriorates the pathologic changes of IgA nephropathy in turn.

VCAM-1 expression in lupus nephritis and crescentic nephritis. *Ma Lijun, and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* The presence of vascular cell adhesion molecule (VCAM-1) in human renal tissues was studied with immunofluorescence technique by the use of anti-VCAM-1 monoclonal antibody 1.4C3. In two normal kidneys, VCAM-1 was expressed on Bowman's capsule and the mesangium area. Lupus nephritis (17 cases) and crescentic nephritis (4 cases) were characterized by the additional presence of VCAM-1 along glomerular capillary walls. This was most marked in the biopsies from patients with active diseased condition. Upregulation, although not to significant levels, was observed for all diseases in the glomerular mesangium. Serum circulating VCAM-1 was detected by immunoblotting technique. Four cases of mild mesangioproliferative glomerulonephritis served as controls. The level of circulating VCAM-1 in 10 cases of lupus nephritis increased significantly as compared with that in the controls ($P<0.01$). These observations indicate that there is a definitely increased expression of VCAM-1 in the kidneys and circulations of patients with lupus nephritis and crescentic nephritis, which may contribute to the recruitment of lymphocytes and monocytes into the inflammatory renal tissue.

Detecting methods of soluble and membrane receptors of tumor necrosis factor (TNF) are applied to the research of kidney diseases. *Liu Xiaojing, Tao Ye, Xu Guozhang, and Liu Xiaorong, Department of Medicine, First Affiliated Hospital, West China University of Medical Sciences, Chengdu, China.* Soluble TNF receptor (STNFR) has been detected in serum. Using broassay (competition binding assay), we determined the level of STNFR in the serums of 20 healthy subjects and 49 SLE patients. The mean±SD level of STNFR was significantly higher in the SLE patients than in the healthy controls (42.7±20.3 vs. 5.1±1.45 u/ml, $P<0.001$). By means of sucrose density gradient ultracentrifugation, we extracted the cell membranes from 4 specimens of normal kidney parenchyma tissue far from the tumor of kidney from renal tumor patients and 6 specimens from the controls. Receptors of TNF in the human kidney parenchyma tissue plasma membrane were analyzed with receptorradioassay. The result showed that there were two kinds of affinity receptors in human kidney parenchyma tissue plasma membrane. On the high affinity TNFR the Bmax of the patients is much decreased as compared with that of the controls (0.498±0.08 vs. 1.252±0.184 pmol/mg protein, $P<0.05$, but there is no significant difference between the kd of them (1.204±0.29 vs. 2.385±0.583 um $P>0.05$). On the low affinity TNFR, the kd of the patients is significantly increased as compared with that of the controls (52.78±8.55 vs. 19.824±2.395 um) while no remarkable difference was found between the Bmax of them (9.752±0.75 vs. 8.42±1.31 pmol/mg protein). Meanwhile we measured the mean±SD level of STNFR in serums of the 4 patients, which was 36.7±7.25 u/ml. Our studies suggest that the remarkably higher level of STNFR in serums of the kidney tumor patients may be due to the shedding of the high affinity TNFR. This may be explained by the downregulation of the cytokine receptor. The application of the method of detecting STNFR and membrane TNFR to the research of kidney disease may play an important role in the pathogenesis of kidney disease.

A comparative study on cellular immunological functions in children with HBV-associated membranous nephropathy (HBV-MN) and idiopathic nephrotic syndrome (INS). *Liu Tonglin, Wang Yunqin, and Yang Jing, Department of Pediatrics, Tongji Hospital, Tongji Medical University, Wuhan, China.* The findings of cellular immunological function in 12 children with biopsy-proven HBV-MN and 12 children with INS were evaluated and compared. The results showed that in comparison with the normal controls, lymphocyte proliferation (Stimulating Index, SI) and IL-2 activity induced by PHA were decreased (*P*

<0.01 and $P<0.05$, respectively), while serum SIL-2R and TNF-a were increased ($P<0.001$ and $P<0.01$, respectively) in HBV-MN group. In INS group, SI was decreased ($P<0.001$), IL-2 activity increased ($P<0.05$) and serum SIL-2R markedly elevated ($P<0.001$), while serum TNF-a did not change, in comparison with the normal controls. There were significant differences in IL-2 activity, serum SIL-2R and serum TNF-a ($P<0.001$, $P<0.001$ and $P<0.05$, respectively), but no difference in SI was found between HBV-MN and INS groups. There was a negative correlation between serum SIL-2R and SI in INS group ($r=-0.638$, $P<0.05$), but no correlation was found in HBV-MN group ($r=-0.288$, $P>0.05$). Serum SIL-2R did not correlated with serum albumin and 24h urinary protein excretion in both groups. Conclusion: There was a cellular immune deficiency in HBV-MN, and a cellular immune disorder and an abnormal lymphocyte activation in INS children. The significant differences in cellular immunological features between the two groups indicate that HBV-MN and INS are two distinct entities. They support an immune pathogenesis in INS. The findings provide us a guidance for differential diagnosis and treatment of the two diseases. On one hand, we should avoid using immunosuppressive drugs, and improve the cellular immunological function in treating HBV-MN; on the other hand, we must use immunosuppressants for effective inhibition of abnormal lymphocyte activation, and some immunomodulators to enhance the cellular immunological functions in treating INS.

Effects of Astragali Acanthopanax Senticosus Harms Mixture (A. A. M) on cellular immunological function of children with idiopathic nephrotic syndrome (INS). *Liu Tonglin, Wang Yunqin, and Yang Jing, Department of Pediatrics, Tongji Hospital, Tongji Medical University, Wuhan, China.* Previously we have reported that the lowered adrenocortical function caused by exogenous steroids in children with INS may be effectively enhanced with the simultaneous use of prednisone and A. A. M, a Chinese medicine, which can obviously reduce the frequency of INS relapses and the side-effects of steroids therapy. In this study, we investigated the effects of A. A. M on the cellular immunological function of 12 children with INS in vitro. The results showed that lymphocyte proliferation (Stimulating Index, SI) induced by PHA was increased markedly to the same level as that of the normal controls by adding a moderate concentration of A. A. M (10^{-5}, 10^{-7} dilution) into the cultured lymphocyte system of INS ($P<0.001$ and $P<0.001$, respectively); slightly increased by adding a low concentration of A. A. M (10^{-9}) ($P<0.05$); and decreased by adding a high concentration of A. A. M (10^{-3}) ($P<0.05$). IL-2 activity was slightly increased while adding a 10^{-6} diluted A. A. M ($P<0.05$). The results suggest that moderate concentration of A. A. M can effectively enhance the cellular immunological function and correct the cellular immune disorders in INS. Therefore it can reduce the infection incidence and frequency of INS relapses. The results also support an immune pathogenesis in INS and provide us a guidance for proper use of A. A. M. It is suggested that there is an inner link between the immunological and adrenocotical mechanisms in reducing INS relapse frequency with A. A. M therapy.

Role of soluble interleukin-2 receptor in nephrotic syndrome in children. *Ma Lu, Zhou Zhuliang, and Yang Qi, Department of Nephrology, 281 Hospital of Beidaihe, Hebei Province, China.* Interleukin-2 (IL-2) is involved in T cell activation in nephrotic syndrome in children. The soluble form of IL-2 receptor (SIL-2R) is released into the medium after antigenic stimulation. Its role in nephrotic syndrome of children is unkmown. The aim of this study was to assess the effectiveness of SIL-2R with ELISA method. We studied 78 patients (29 females and 49 males; mean age: 8.7 years; age range: 2～14 years) with nephrotic syndrome proven by biopsies and 40 healthy children as controls. The patients were divided into two groups according to the clinical feature and laboratory examination. Forty-five children with edema, severe proteinuria and hematuria formed the active group; 33 children without edema, proteinuria and hematuria formed the inactive group. The serum level of SIL-2R was measured in both the controls and the patients. It was found higher in the active group than in the healthy controls (875 ± 87 vs. 312 ± 59 μ/ml, $P<0.01$) and the inactive group (875 ± 87 vs 408 ± 58.5 μ/ml, $P<0.01$). There was a close relationship between the quantity of proteinuria and the serum level of SIL-2R ($r=0.89$, $P<0.001$); but there was no correlation between the renal pathologic type and the serum level of SIL-2R. The results suggest that serum SIL-2R may be a marker of the clinical activity of nephrotic syndrome in children.

Role of cytotoxic factor in glomerulopathy. *Ma Jianfei, and Zhou Xijing, Department of Nephrology, First Clinical College, China Medical University, Shenyang, China.* The level of cytotoxic factor in the plasma and urine and the dynamic change of its activity before and after the treatment were examined with crystal violet staining in 50 patients with glomerulopathy. The result showed that the activity of the factor increased in active glomerulopathy, intractable nephrotic syndrome and the late

stage of uremia treated by hemodialysis. After treatment the level of cytotoxic factor decreased gradually to normal with the remission and relief of these diseases. The present data suggest that cytotoxic factor plays a significant role in the development of glomerulopathy and it has a close relation to renal lesion. Therefore, it has important clinical significance in the prognosis of glomerulopathy, according to its dynamic change.

Effects of peripheral blood mononuclear cell products of nephrotic patients on rat glomerular epithelial cells. *Wang Dan, Yang Jiyun, and Wang Baolin, Pediatric Department, The First Clinical Medical School, Beijing Medical University, Beijing China.* To identify the role of circulating immune factors in the mechanism of proteinuria in nephrotic syndrome (NS), the supernatant of peripheral blood mononuclear cell (PBMC) was obtained from 15 steroid-responsive patients with NS, and its effects on sulfated compound synthesized by cultured rat glomerular epithelial cells (GEC) was studied with $^{35}S^{3}H$-Lucine dual isotope labeling technique. The patients were divided into 2 groups. Group 1 were NS patients without steroid treatment and group 2 were nephrotic patients treated with prednisone (1.5～20 mg/kg) for 4～7 days. The results were expressed by stimulating index (SI).

	^{35}S	^{3}H
Group 1 (9)	1.66±0.40	1.43±0.42
Group 2 (6)	0.93±0.41	0.98±0.33
Controls (6)	0.91±0.12	1.01±0.07

The SI of ^{35}S in group 1 was significantly higher than that in group 2 and the control group ($F=8.0034$, $P<0.001$), while the SI of ^{3}H-L in the 3 groups showed no significant difference ($F=2.837$, $P>0.05$). These results suggest that the products of PBMC from nephrotic patients can affect the biological function of rat GEC in vitro, but this effect could not be found in patients treated with prednisone. The promotive effect of PBMC on S compound synthesis might be a compensation to the accelerated turnover of HSPG (heparan sulfate proteoglycan) in the GBM during NS.

Study on T lymphocytes and lymphokines of patients with minimal change nephrotic syndrome. *Liu Yuxia, Qian Jiaqi, and Zhang Qingyi, Renal Division, Renji Hospital, Shanghai Second Medical University, Shanghai, China.* The glomerular lesion in minimal change nephrotic syndrome (MCNS) has been postulated to be related to abnormal T cell function. Many researchers have reported that patients with MCNS has abnormal T lymphocyte immunoregulation and the in vitro T lymphocytes to mitogen had been in a state of hyporesponsiveness. Recently most researchers found that there were some lymphokines existing in MCNS patients, and T-derived soluble factor or factors were toxic to glomeruli and could also cause proteinuria in animals. In our study, the total lymphocytes and T subpopulation in peripheral blood were measured with FCM in 27 patients with clinically and biopsy (22 cases) proven INS. Meanwhile the concentration of IL-2 production of separated T-cells (by 3H-TR incorporation assay) and soluble form of IL-2 receptor (SIL-2R) in serum were also measured. The results showed that the total T lymphocytes (CD_3), T subpopulation (CD_4 and CD_8) and CD_4/CD_8 ratio in MCNS group had no significant difference from those in the control group and the group of other types of INS ($P>0.05$). In vitro, the IL-2 production of separated T-cell was significantly decreased in patients with MCNS ($P<0.01$), when stimulated with PHA-m as compared with the normal controls. However, no significant difference was found between MCNS and other histological types, ($P>0.05$). The plasma level of SIL-2R in MCNS patients was significantly higher than that in both the control group ($P<0.001$) and the group of other histological types of INS ($P<0.05$). The results suggest that sera from patients with MCNS inhibit IL-2 (one lymphokine) production of normal T lymphocytes in response to PHA-m, despite a normal number of total T-cells and T subpopulations. Essential defect of lymphocytes from patients with MCNS may be one of the probable pathogenesis. The lymphocytes were in an activated state in which they secreted some lymphokines. Our data showed that SIL-2R caused a downmodulation on the IL-2 dependent proliferative response. The properties and mechanisms of other lymphotic factors are still to be investigated.

Influence of IL-1 and hydroxyl radical produced in glomerular macrophages on glomerular injury. *Wang Li, Zhao Zhihui, and Wang Haiyan, et al. Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* The production of IL-1 and reactive oxygen species in glomerular macrophages in accelerated nephrotoxic nephritis and the relationship between IL-1 and reactive oxygen species were explored with the techniques of thymocyte proliferation and electron spin resonance (ESR). The results showed that IL-1 activity in glomerular macrophages in the rats with accelerated nephrotoxic nephritis was significantly higher than that in the controls; and the production of hydroxyl radical in glomerular macrophages in the nephritis rats increased significantly in comparison with that in the controls. The production of hydroxyl radical in glomerular macrophages by rIL-1β in-

creased significantly. It suggested that the production of IL-1 and hydroxyl radical in glomerular macrophages may play an important role in the pathogenesis of renal injury in accelarated nephrotoxic nephritis.

Preventive effect of free radical scavengers on cytoxan induced gonadal damage in male rats. *Guo Renshou, Kang Guogui, Chen Zhongyi, Wu Gang, and Xu Jiaqi, Department of Pediatrics, Second Affiliated Hospital, Hubei Medical University, Wuhan* 430071, *China.* A preventive effect of the free radical scavenger (FRS) Vit. E, Vit. C and allopurinol on cytoxan (CTX)-induced gonadal damage was studied in this experiment. The results revealed that the contents of malondiadehyde in serum (sMDA) and in testicular homogenization (tMDA) were lower in the preventive group (PG) than in the CTX group (CG) (2.42 ± 0.70 vs. 4.20 ± 2.58 nmol/ml, $P<0.05$ and 5.63 ± 1.79 vs. 8.40 ± 2.82, $P<0.05$ respectively). The contents of superoxide dismutases in serum (sSOD) and in testicular homogenization (tSOD) were higher in the preventive group than in the CTX group (37.00 ± 15.80 vs. 13.6 ± 6.00 u/ml, $P<0.01$ and 31.10 ± 5.10 vs. 21.20 ± 5.5, $P<0.05$, respectively). The weights of testis (T), epididymal head body (EHB) and tail (ET) were greater in PG than in CG (T: 1 110.9 ± 140.2 mg vs. 909.5 ± 143.0 mg, $P<0.01$; EHB: 142.4 ± 42.1 vs. 92.0 ± 30.5, $P<0.01$; ET: 93.6 ± 32.3 vs. 58.0 ± 23.6, $P<0.05$). The numbers of sperm in T and EHB were larger in PG than in CG, while that in ET was not (T: 34.28 ± 12.02 × 10^6 vs. 23.87 ± 5.46/one testis, $P<0.05$; EHB: 15.93 ± 5.66 vs. 9.43 ± 6.26, $P<0.05$; ET: 7.56 ± 4.11 vs. 5.68 ± 2.82, $P>0.05$). The number of sperm produced daily in one testis in PG (5.66 ± 1.97) was higher than that in CG (3.87 ± 1.07, $P<0.05$). A higher number of offsprings and lower number of resorbed embryoes were observed in PG as compared with CG (4.17 ± 1.47 vs. 2.17 ± 1.33, $P<0.05$ and 2.67 ± 1.21 vs. 7.36 ± 2.80, $P<0.01$ respectively). Under light microscope, no testiscular morphological change was found in both groups. However, the ultrastructural alterations of testis showed that the mitochondria of spermatis vacuolated and the number decreased. In CG the lysosomes lost their normal shape and the spermatid nucli was damaged but these changes were not very marked in PG. The above results suggest that FRS has a preventive effect on CTX-induced gonadal damage, and free radical damage may be closely related with the mechanisms of CTX-induced gonadal damage.

Glucocorticoid and modified decoction for reinforcing the spleen activate glomerular antioxidant enzymes and attenuate glomerular oxidant injury. *Li Youji, and Xie Chun, Renal Research Institute, First Affiliated Hospital, Sun Yat-sen University of Medical Sciences, Guangzhou, China.* The importance of reactive oxygen species (ROS) mediated glomerular oxygen injury has been emphasized recently. It is reasonable to speculate that the development of glomerular injury depends on the balance between the generation of ROS and tissue antioxidant enzymes (AOE). In the present study, we examined whether endogenous glomerular AOE activity can be elevated by the treatment with modified decoction for reinforcing the spleen (MDRS) or methylprednisolone (MP), and whether the alteration of AOE plays a role in attenuating ROS mediated glomerular injury. Glomeruli isolated from Wistar rats treated with MDRS daily or daily i.p. injection of MP (15mg/kg body weight, MP15) for either 3 days or 14 days had significantly higher total (T)−, copper-zinc (CuZn)−, and manganese (Mn)− superoxide dismutase (SOD), glutathione peroxidase (GSH-PX) and catalase (CAT) activities than the controls ($P<0.05$). The same treatment was applied to adriamycin-induced nephropathy (AN, induced by a single i.v. dose of adriamycin, 6mg/kg), a known ROS − mediated glomerular injury model similar to human minimal change nephropathy (MCN). Two days after the adriamycin injection, AN rats given MDRS or MP15 presented higher activities of glomercular T-SOD CuZn-SOD, GSH-PX, CAT and total antioxidant capacity (TAOC) than untreated AN rats ($P<0.01$). Likewise, 13 days after the adriamycin injection, AN rats treated with MDRS or MP15 had significantly higher activities of glomerular T-SOD, CuZn-SOD, Mn-SOD, GSH-PX, CAT and TAOC than untreated AN rats ($P<0.01$). It was also found that elevated glomerular malondialdehyde (MDA) level in AN rats was absent, and proteinuria and hypoalbuminemia in AN rats were significantly less, either in MDRS or MP15 treated AN rats ($P<0.01$). Pathologically, epithelial foot process fusion characteristic of AN rats was markedly attenuated in MDRS or MP15 treated AN rats. Our data suggest that one of the mechanisms of the therapeutic effect of MDRS or glucocorticoid on MCN may be the activation of the intrinsic glomerular AOE activity and protecting glomeruli from ROS-mediated injury. The data also provide an indirect evidence for the assumption that MCN in AN rats is ROS-mediated.

The 3-dimensional reconstruction of human glomerular mesangial cells with laser scanning confocal microscope. *Yu Lifang, Chen Xiangmei and Xu Qihe, Department of Nephrology,*

General Hospital of the Chinese PLA, Beijing 100853, *China.* We used to observe the 2-dimensional structure of glomerular mesangial cells under ordinary microscope and know little about their stereoscopic structure. In the present study, cultured human glomerular mesangial cells were stained with fibronectin monoclonal antibody conjugated with FITC, and were observed under ordinary fluorescence microscope and laser scanning confocal microscope (LSCM, InSIGHT Plus, made by Meridian Company, U. S. A) respectively. Just like under ordinary microscope, we found two different shapes of the mesangial cells. One was irregular and star-like, and the other was elliptical. The structures of mesangial cells observed under ordinary fluorescence microscope and LSCM were compared with each other. The former appeared as unclear 2-dimensional pictures while the latter was shown as very clear tomographs or 3-dimensional pictures. We could learn the internal structure and biochemical changes of the cells and analyze their parameters by the use of LSCM instead of the ordinary fluorescence microscope. Conclusions: The superiorities of LSCM over ordinary fluorescence microscopes include a function of cellular computerized tomography and the combination of 3-dimensional imaging with internal imaging. Moreover, with a LSCM, we can study a cell not only on its structure, but also on its function and biochemical changes at the same time.

Effects of blocking of glucocorticoid receptor on passive heymann nephritis in rats. *Li Baochun, et al. Department of Nephrology, Changhai Hospital, Shanghai* 200433, *China.* The effects of RU486, a competitive antagonist of glucocorticoid receptor (GR) on biochemical and pathological changes of rats with passive Heymann nephritis (PHN) were discussed. PHN was induced by heterologous anti-FX1A as described by Edgington, et al. RU486 were injected intramuscularly q. d. for 9 days (10mg/kg/d) and 59% of GR were blocked as determined by radio-ligand binding assay. The results indicatd that the blocking of GR produced dual effects on PHN rats as to decreasing the immune deposition on immunofluorescence, increasing mediator of complex injury such as TXB_2 and LPO in renal cytosol, and activating the phagocytosis of PHN rats glomerulus cells using electron microscopy and proteinuria excretion late in time and small in quantity. Thus, it is suggested that glucocorticoid shoued be rationally used clinically, and its unfavourble factor to nephritis as well as its side effects be taken into account.

Study on the correlation of glucocorticoid-glucocorticoid receptor system with passive Heymann nephritis. *Xu Anping and Cui Ruolan. Department of Nephrology, Liu Hua Qiao Hospital, Guangzhou, China.* Glucocorticoids (GC) are the steroid hormones whose functions include anti-inflammatory and immunosuppressive actions in body. GC actions are mainly mediated by GC binding to glucocorticoid receptors (GR). It is known that the proteins named lipocortin being induced through binding of GC to GR inhibit eicosanoid release by inhibiting the enzyme phospholipase A_2 (PLA_2) activity of releasing arachidonic acid. The relation between changes of serum corticosterone (CS) level, renal cortex cytosol GR concentraction, renal cortex PAL_2 activity and glomerular injury in rats with PHN was studied. The results were as follows: (1) serum CS level was decreased, while renal cortex cytosol GR concentraction and renal cortex PLA_2 activity were increased in rats with PHN. The changes were significant as compared to normal rats:

Group	N	Serum CS (μg/ml)	Renal GR (fmol/mg pro)	Renal PLA_2 (U/mg pro)
PHN	8	0.220 ± 0.087^a	338.1 ± 71.3^a	10.66 ± 3.65^b
Control	8	0.343 ± 0.109	274.8 ± 37.8	6.12 ± 2.02

a: $P<0.05$, b: $P<0.01$ vs the control

(2) In pathomorphology, glomeruli in rats with PHN showed bright granular capillary wall staining for rabbit IgG, rat IgG and C_3 on immunofluorescence microscopy. Small electron-dense deposits in a subepithelial location, fusion of podycyte foot processes and thickened glomerular basement membrane were seen by electron microscopy. These results suggested that anti-inflammatory and immunosuppressive actions of GC-GR system were lowering in rats with PHN. It is suggested that insufficiency of effects of GC-GR system should be associated to the onset and progress of PHN.

Effects of interference by Cordyceps sinensis (Berk.) Sance. on passive Heymann nephritis. *Li Zilong, Zhou Xijing and Ren Qing. Department of Nephrology, First Affiliated Hospital, China Medical University, Shenyang, China.* The Pathologic findings of passive Heymann nephritis (PHN) in rats were mostly similar to the human membranous nephropathy (MN). In the past decade, passive Heymann nephritis served as a classic model for research of human membrane nephritis. In this paper, the correlationship between the distribution of anionic sites on glomerular basement membrane (GBM) by PEI as a tracer (in vitro) and the effect of interference by Cordyceps sinensis (Berk.) Sace. in this model was observed with the results show-

ing that Cordyceps sinensis (Berk.) Sace. was effective in preventing the formation of subepithelial immune deposits in situ, protecting negative charge barrier on GBM and decreasing proteinuria in the early stage of PHN.

The expression of high affinity interleukin-2 receptor (IL-2R) and production of interleukin-2 (IL-2) of the lymphocytes in patients with primary nephrotic syndrome (PNS). *Fu Ping, Xu Guozhang, Huang Songming, Yu Qinglong, Liu Xianrong and Qu Xulin. Departments of Internal medicine, the First General Hospital of West China Univertty of Medical Sciences, Chendu, China.* In the present study, the radioligand binding assay (RBAA) was used to study the expression of IL-2R, and the production of IL-2 of peripheral blood mononuclear cell (PBMC) from 22 patients with PNS, 17 patients with PNS in remission, and 25 normal subjects matched with age and sex. The results showed that the expression of IL-2R is 1550.92±347.02 binding sites per cell, and the activity is 9.50±1.50IU/ml in patients with PNS, while in the normal subjects, the expression is 3455.07±535.13 binding sites per cell, and the activity is 16.20 ±1.38 IU/ml. The data in PNS group was significantly lower than those in the normal subject group ($P<0.05$). The expression of IL-2R is 2303.04±350.94 binding sites per cell, and the activity is 12.23±2.10 IU/ml in patients with PNSS in remission. All data of the third group were significantly different from those of the two groups mentioned above ($P<0.05$).

It is concluded that the expression and the production of IL-2 are closely related with the course of PNS. The cell mediated immunity (CMI) during acute nephrotic phase is lowest. Whether it is primary or secondary is not clear. The CMI in patients with PNS in remission was much more improved as comparing with that in the acute nephrotic phase, but not recovered completely; the deficiency of CMI in patients with PNS in remission may be a factor in relapse of PNS, and be an indicator of the activity of PNS.

Detection of IL-1β, IL-1ra mRNA expression by peripheral blood mononuclear cells (PBMC) in idiopathic nephrotic syndrome (INS) using biotin-labelled prode in situ hybridization. *Liu Xuehui, Yang Jiyun, Wang Shengwu. Department of pediatrics, the First Clinical School of Medicine, Beijing Medical University, Beijing* 100034, *China.* Interleukin-1 (IL-1) is a cellular product that exerts numerous immunostimulatory and inflammatory effects. However, little is known about its role, especially its mRNA expression in INS. In this study, the technique of in situ hybridization was used to investigate the expression of IL-1β, IL-1ra mRNA by PBMC from 4 cases of INS. The method involved the hybridization with a biotin-labelled cDNA probe to target mRNA in cells in situ on a microscope slide. A signaling group (alkaline phosphatase) covalently attached to streptavidin is then bound to the biotinylated probe. The hybridization probe is detected by incubating the samples with dye substrates for alkaline phosphatase, nitroblue tetrazolium (NBT) and 5-bromo-4-chloro-3-indolylphosphate (BCIP). Formation of a purple signal indicates the location of the hybridized probe, and then the hybridized signals were quantitatively analysed by ture color medical image analysis system. The results were expressed by IOD/100 cells (integral optical density). The results showed: IL-1β and IL-1ra mRNA expression of PBMC in INS were significantly lower than those of the normal control (107.63±20.80 vs 195.56±31.14 and 144.45±11.42 vs 370.38±100.48, respectively, $P<0.05$). The expression of IL-1β mRNA was significantly lower than the IL-1ra mRNA expression of PBMC in INS (107.63±20.80 vs 144.45±11.42, $P<0.05$). The ratio of IL-1β mRNA/IL-1ra mRNA in INS and control showed no difference ($P>0.05$). It suggested that there should be a dysregulated expression of interleukin-1 family mRNA of PBMC in INS and its significance needs further study.

Different expressions of α2(IV) and α3(IV) collagen mRNAs in renal glomeruli of IgA nephropathy. *Zheng Feng and Li Leishi. Research institute of Nephrology, Jinling Hospital, Nanjing, China.* An increase in the levels of extracellular matrix protein mRNAs prior to the appearance of histological glomerulosclerosis has been demonstrated in isolated glomeruli from several animal models. Striker has recently initiated the studies in renal biopsies (Seminar in Nephrology, 13: 508, 1993). A comparable study in human renal biopsies was made to assess the levels of glomerular α2(IV) and α3(IV) collagen genes expressions in renal biopsies. Renal biopsy specimens were obtained from 10 patients (6 IgA nephropathy and 4 mesangial proliferative glomerulonephritis). The grade of glomerular lesion was divided into 5 degrees. The amount of collagen type IV in glomerular matrix was evaluated by immunoperoxidase stainning using a monoclonal antibody to type IV collagen. For gene expression analysis, glomeruli were dissected out from about 10% of each biopsy specimen. The expressions of α2 (IV) and α3(IV) collagen mRNAs were analyzed using in situ reverse transcription coupled with polymerase chain reaction (PCR). Each PCR reaction contrained an amount of cDNA template equivalent to that obtained from 1/10 of a glomerulus. α2(IV) and α3(IV) collagen mRNAs were

detected in all specimens. All 3 cases of IgAN with grade III glomerular lesion had a more marked increment of glomerular α2 (IV) collagen cDNA than that of the other 3 IgAN patients with grade II lesion (the intensity of PCR product, grade III 0.54± 0.12, vs grade II 0.25±0.08, $P<0.05$). No discrepancies were detected in the level of glomerular α3(IV) collagen cDNA and the intensity of collagen IV stainning between these two groups of IgAN. Interestingly, in MsPGN patients there was no difference in the expression of glomerular α2(IV) collagen mRNA between grade II and grade III glomerular lesion. The results of this study suggested that the detection of glomerular α2(IV) collagen mRNA level in IgAN patients may be helpful to define the pathological classification in predicting prognosis.

Expression of report gene LacZ in cultured human mesangial cells. *Zhao Hui, Lu Min and Wang Haiyan. Department of Nephrology, First Teaching Hospital, Beijing Medical University, Beijing, China.* To study whether a foreign gene can express in human mesangial cells (MCs), we constructed a retroviral plasmid pN2-LacZ containing a reported gene LacZ and neomycin gene. Then pN2, pN2-LacZ recombinant plasmids were transfected into packaging cell Crip by means of lipofectin. The cultured human MCs were infected with the pseudoviral supernatant and selected with G418 medium. Infected cell may remain survived. Large healthy colonies were picked out and expanded. Infected cells producing β-galactosidase would become blue while adding with X-gal. It was found that 30% pN2-LacZ infected cells were stained blue, while pN2 infected cells were not stained blue. These reults suggested that the foreign gene LacZ could express in human MCs.

HLA-DR, -DQ gene frequencies in IgA nephropathy patients obtained by oligonucleotide genotyping. *Chen Nan, Fei Hongming, Qian Ping, Gu Z, Jiang YD, He CL, Lou Dingxiu and Dong Dechang. Department of Nephrology, Rui Jin Hospital, Shanghai Second Medical University, Shanghai, China.* Forty-seven unrelated adult Chinese Han patients with biopsyproved IgA nephropathy were studied for HLA-DR and -DQ gene frequencies using polymerase chain reaction (PCR) and a set of more than 50 sequence specific oligonucleotide (SSO) probes. It was found that the gene frequency of HLA-DR4 was significantly increased in these patients as compared with that in 92 healthy control persons of the same nationality ($P<0.05$). The incidence of DR4 was especially higher in patients with massive proteinuria ($P<0.01$), chronic renal failure and focal segmental sclerotic glomerulonephritis. Though the gene frequencies of DRw14(6) and DQB1 * 0503 were increased and those of DQB1 * 0602 were decreased, their associations with IgA nephropathy remained to be confirmed because there was relatively small sample involved in our research.

Expression of endothelin and endothelin receptor genes in cultured glomerular mesangial cells. *Chen Jiankang, Zou Wanzhong, and You Jiangfeng. Department of Patholgoy, Beijing Medical University, Beijing* 100083, *China.* Glomerular mesangial cells (MCs) are active glomerular intrinsic cells. MCs response to various stimuli. MCs proliferation and accumulation of mesangial matrix are involved in the pathological processes of most glomerular diseases. Endothelin (ET) may be one of the many factors governing MCs proliferation and matrix synthesis. The interrelationship between ET and MCs was investigated in the present study.

The experiments were performed with cultured SD-rat MCs as follows: 1). Contractility experiments were conducted using a camera-equipped inverted phase contrast Nikon microscope. The MCs were photomicrographed before and after having stimulation with 10^{-7}M ET-1; 2). ET was added to the medium to observe its immediate effect on MCs in culture, then [^{3}H] thymidine was incorporated to determine whether ET can induce mitogenesis in MCs; 3). To identify the expression of ET and ET receptor genes in MCs, extracted RNA from MCs were used to perform reverse transcription and polymerase chain reaction (RT-PCR) assay with oligonucleotide primer pairs specific for rat sequences of prepro ET-1 and of ET_Breceptor respectively, and Northern blot analysis; 4). Immunocytochemistry was tried to testify the synthesis of ET peptide in MCs; 5). A specific radioimmunoassay was used to measure ET concentration in the MCs supernatants. The results showed that ET induced MCs contraction; ET stimulated mitogenesis in MCs; the expressions of both ET and ET receptor genes existed in MCs; ET peptide was synthesised in MCs; and MCs released ET peptide into culture supernatants.

Our results suggested that 1) active production of ET by MCs should contribute to modulate glomerular vascular tone, possibly counteracting the vasodilatory actions of endothelium-derived relaxing factor (EDRF), and control glomerular filtrated function; 2) the ability of MCs to release ET peptide coupled with the demonstration of the presence of ET receptor on MCs and of the proliferative response of MCs to ET should raise the possibility of a potential autocrine mechanism (in addition to a paracrine pathway), a vicious cycle, by which ET possibly contributes to the process of glomerular injury and sclerosis.

Inflammatory effects of endothelin-1 on human mesangial cells. *Sun Yijuan, Chen Yipu, Lü Xiaoyan, Gao Jin, Wang Haiyan. Institute of Nephrology, Beijing Medical University, Beijing, 100034, China.* Endothelins (ETs) are a family of constrictor peptides discovered by Yanagisawa and his colleagues in 1988. ET-1 has important physiological actions on the kidney, and may also be the pathogenesis of some kinds of glomerulonephritis. In this experiment, the mechanism of inflammatory effects of ET-1 on human mesangial cells (MsC) was investigated by using Northern blotting hybridization technique. Research results showed 1) 10^{-7}M ET-1 markedly increased c-fos and c-jun protooncogene mRNA expression of MssC at 30 minutes after addition of ET-1 into the media; 2) when MsC were stimulated by ET-1 at different concentrations (10^{-7}、10^{-9}、10^{-11}M) and different durations (12、18、24hr), no IL-1 activities were found in the media and no IL-1 mRNA was expressed in MsC; 3) At 8、16、24hr after stimulation of 10^{-7}M ET-1, TNFα mRNA expression in MsC was up-regulated; 4) ET-1 mRNA expression was enhanced at 8、16、24hr after the MsC were incubated with ET-1 (10^{-7}M) itself. All above results suggest that c-fos and c-jun protoongenes might play an important role in the regulation of MsC proliferation which is stimulated by ET-1; the inflammatory effects of ET-1 might not be mediated by IL-1, but possibly mediated by TNFα; there is positive-feedback action of ET-1 in mesangial cells resulting in expansion of its inflammatory effects.

Emodin inhibited SV-40 transgenic mesangial cell proliferation and C-myc mRNA expression. *Hu Weixin, Li Leishi, Liu Zhihong, et al. Institute of Nephrology, Jinling Hospital, Nanjing, China.* SV-40 transgenic mesangial cells have remarkably enhanced proliferative capacity. In this paper, we investigated the effect of Emodin, an extract of Rhubarb, which has been proved effective in preventing the progression of chronic renal failure, on cell prolifertion, proliferative cell nuclear antigen (PCNA) and C-myc mRNA expression of SV-40 MCs. PCNA was detected by four-layer PAP method. C-myc mRNA expression was observed by standard dot-blot hybridization. The results showed that H-TdR incorporation in 5μg/ml Emodin-treated cells was 50% of that of the control. PCAN negative cells in Emodin (5μg/ml) treated SV-40MCs were 26%, whereas, 6.8% in control ($P<0.01$) and the proportion of PCNA positive cells in S2 stage were lower in Emodin treated cells (38% vs 70%). Serumfree cultrured SV-40 MC had low level expression of C-myc mRNA, but much higher level was detected in 5% FCS containing medium cultured cells. Interestingly, this over C-myc mRNA expression was greatly suppressed by Emodin (5μg/ml). Cycloheximide, a protein synthesis inhibitor, had no effects on this process. Concluion: Emodin inhibited the proliferation and cell cycle of SV-40MC. The inhibition of Emodin on the abnormal proliferative MC could be usefuf in treatment of glomerulosclerosis.

Transfection of human TGFβ1 sense and antisense expression vector into monkey tubular cell line and its expression. *Zhao Hui, Lu Min, Wang Haiyan, Department of Nephrology, First Teaching Hospital, Beijing Medical University, Beijing, China.* An efficient and safe method to target novel genes to specific cell population of adult kidney could lead to new mode of treatment for renal diseases. Transfecting gene into cells needs to be investigated. Transferring sense, antisense TGF β1 expression vector into monkey tubular cell line (cos-7) was attempted by lipofectin. Many colonies of the transfected cos-7 cell were obtained by selection with G418. Whether TGF β 1 expression vector expresses or not, was proven by in situ hybridization, in which two kinds of ODN probes were used: sense TGF β 1 to measure antisense mRNA, and antisense probe to measure sense mRNA. It was found that 1) in sense TGF β 1 expression vector transfected cells, sense TGF β 1 mRNA hybrid signal was stronger than cells without transfection; 2) in antisense TGF β 1 expression vector transfected MCs, hybrid signal of antisense TGF β 1 mRNA was stronger than untransfected cells.

Tumor necrosis factor-α and glomerular mesangial cells. *Dong Bao*, Zou Wanzhong and You Jiangfeng. * Department of Nephrology, Navy General Hospital Beijing* 100037, *China. Derpartment of Pathology, Beijing medical University, Beijing,* 100083 *China.* Tumor necrosis factor-α (TNF-α), being one of cytokines from macrophages, plays a role in pathogenesis of glomerular diseases. In this study the relationship between TNFα and mesangial cells, and the corces of TNF-α in glomeruli were observed by way of that 1) the mesangial cells cultured from SD rats were stimulated by TNFα, and the [^{3}H]-TdR incorporated method was used to determine TNFα content and activity; 2) the rats were injected with TNFα into right renal arteria, and the renal tissue morphologic changes were analyzed.

The results showed: 1) the supernatant of cultured mesangial cells had TNFα, which increased gradually in a certain time. Mesangial cell have the autocrine function of TNFα; 2) DNA synthesis of mesangial cells could be stimulated by TNFα and depending on the consistency of TNFα. TNFα stimulated mesangial cells proliferation; 3) TNFα could stimulate messangial cells to secrete endothelin while it stimulated mesangial cells' prolifera-

tion. TNFα might influence the autocrine function of mesangial cells; 4) the glomerular mesangium became wider in the injected kidney. TNFα could also stimulate mesangial cells proliferation in vitro.

These studies suggest that TNFα could stimulate mesangial cells proliferation and influence the autocrine function of mesangial cells. The effect of mesangial cells proliferation can be influenced by TNFα either from macrophages or from mesangial cells.

Fibronectin, stimulating effect on the phagocytosis of glomerular mesangial cells. *Yao Jian, Yan Haiyan, Liu Yuqing and Dong Dechang. Department of Nephrology, Rui-Jin Hospital, Shanghai, China.* In our previous studies, a decrement of intraglomerular fibronectin (FN) in facial segmental glomerular sclerosis and an augment on FN in mesangioproliferative glomerulonephritis have been proved. Besides, it was shown that FN had a stimulating effect on the phagocytosis of the polymorphonuclear cells in vitro. If FN appears to have the same effect on the mesangial cells (MC) it woued be the aim of this work.

Rat glomeruli and MC were isolated and cultured. The phagocytic capacity of MC was measured with photoelectric colorimetry according to the quantity of H_2O_2 produced. There was a relationship between the level of FN in 6.25 to 100 μg/1 × 10^6MC, ($r=0.899$, $Y=443.8\pm0.48x$ $P<0.05$). The bovine serum albumin had no this effect at the same concentration ($r=-0.12$, $P>0.05$), suggesting that FN should promote the phagocytosis of MC.

The result showed that some of FN in early stage may play a role in clearance function of glomeruli, and also, the accumulation of FN might be a factor of glomerular sclerosis.

DNA-anti-DNA immune complexes enhancing IL-6 production by mouse mesangial cells. *Chen Yongxiong, Wang Dan, Ye Rengao, and Yin Peida. Kidney Research Institute, Sun Yat-Sen University of Medical Sciences, Guangzhou, China.* Interleukin-6 (IL-6), an autocrine growth factor for glomerular mesangial cells (MCs), may be involved in the pathogenesis of mesangial proliferative glomerulonephritis. Previous studies reported that, besides IL-1 β and tumor necrosis factor α and lipopolysaccharide, IgG as well as anti-human serum albumin immune complexes can enhance IL-6 production by MCs DNA-anti-DNA immune complexes (DNA-anti-DNA ICs) is one of the ICs formed or deposited in glomerulus with lupus nephritis (LN). Using the IL-6 dependent hybridoma cell line KD83, we investigated the relationship between DNA-anti-DNA ICs being purified from the sera of LN patients by using the method of high performance gel permeation chromatography and IL-6 production by mouse MCs. The results showed that DNA-anti-DNA IgG and DNA-anti-DNA IgM as well as DNA-anti-DNA IgA all enhance IL-6 production by MCs. Of those DNA-anti-DNA ICs, the effect of DNA-anti-DNA IgM on IL-6 production by MCs was significant. This enhanced production of IL-6 by MCs was dependent on the concentration of DNA-anti-DNA ICs. This result indicated that DNA-anti-DNA ICs formed or deposited in glomerulus can stimulate the production of IL-6 by MCs which may be related to the glomerular mesangial proliferation of LN.

Detection of cGMP Response to three kinds of natriuretic peptides and the observation of their receptor binding sites. *Cao Hongdi, Lou Dingxiu, Yao Jian and Dong Dechang. Department of Nephrology, Rui-Jin Hospital, Shanghai, China.* Atrial natriuretic peptide (ANP), brain natriuretic peptide (BNP) and C-type natriuretic peptide (CNP) are all playing important roles in the regulation of urine sodium and water excretion, blood pressure control and fluid and electrolyte homeostasis. Kidney, as the target organ, posesses the receptor sites of these three kinds of biologically activated peptides. The biological activities of these peptides are mediated by accumulation of guanosine 3', 5'-monophosphate (cGMP) through the activation of particula guanylyl cyclase when binding their receptors.

In this study, the different peptides, ANP_{99-126}, $BNP_{32}$and CNP_{22} were used to stimulate the incubated human mesangial cells respectively, then the cGMP was detected to determine their biological activities, if presentation of binding sites in the meseangial cells.

It was found that the cGMP production is not the same to the different peptides stimulation, showing that the binding sites were not the same for each peptide. The potency of cGMP production is CNP≥ANP>BNP. CNP induces cGMP increase at a concentration as low as 10^{-11}M, while ANP, BNP do not induce cGMP production until the concentration of 10^{-6}M. It was suggested that there should be more CNP binding site in human mesangial cells.

Effect of PAF (platelet activating factor) on human mesangial cell proliferation. *Lü Xiaoyan, Gao Jin and Wang Haiyan. Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* PAF is a potent phospholipid mediator. It is widely accepted that PAF is acting through its reaction with its specific membrane receptors. The substrate and enyzme re-

quired for PAF metabolism are available in the kidney, and have multiple effects on in vitro renal cells. The present study was aimed at its effect on human glomerular mesangial cell proliferation. 5% fetal calf serum was added to the culture medium solely as a negative control, and 20% fetal calf serum as positive. We applied different amounts of PAF to the culture medium in the presence of 5% fetal calf serum, 1μCi/hole of HTdR was incubated with the cells for 18 hours. Then the cells were collected, the value of cpm were counted on a liquid scintilation counter. The results showed that PAF stimulated mesangial cell proliferation at a concentration of 10^{-14}M, and this effect increased with the concentration up to a plateau at 10^{-10}-10^{-8}M. When the concentration of PAF reached 10^{-4}M, an inhibitory effect immerged. The present investigation showed a biphase effect of PAF on human mesangial cell proliferation, by a low dose stimulation and a high dose inhibition.

Effects of collagen I, endothelin-1 on the proliferation and the extracellular matrix by glomerular endothelial cells and mesangial cells. *Duan Yonggang and Chen Xiangmei. General Hospital of PLA, Beijing, China.* The effect of collagen I, endothelin-1 on endothelial cells (EC), mesangial cells (MC) proliferation and matrix synthesis were investigated. MC and EC from human glomeruli were cultured in vitro. EC and MC were divided into three groups respectively. Both of them were cultured in collagen I (0.1%), endothelin-1 (1.33×10^{-9}) basal medium for 8 days. Results showed that the number of EC counted in collagen I group was higher than in the control [$(6.56+0.61)*10^5$ vs $(2.73+0.43)*10^5$, $P<0.01$]. But MC counted could not be found significant in difference as compared with the control. Laminin, fibronectin (FN), collagen IV in the supernatant were assessed by ELISA. The level of laminin and FN was higher in the supernatant when EC grew on collagen IV than the control. The level of collagen IV and FN was higher in the supernatant when mesangial cell grew on collagen I than control. The level of FN in the supernatant is higher when mesangial cell grew in the medium with endothelin-1. Conclusion is that collagen I can enhance endothelial cell to grow, and promote EC to secrete laminin and FN. At the same time collagen I also can promote mesangial cell to secrete collagen IV and FN, endothelin-1 may promote mesangial cell to secrete FN.

Suppressive effect of transforming growth factor β on the production of complement inhibitory activity by human mesangial cells (HMc). *Yao Jian and Li Leishi. Institute of Nephrology, Jinling Hospital, Nanjing, China.* Complement activation and its activities are controlled by a variety of fluid and cell membrane-associated inhibitory. Several reports have demonstrated the production of complement and complement regulatory protein by cultured mesangial cells. As transforming growth factor β (TGF β) has both pro-and anti-inflammatory effects, and plays an important role in the pathogenesis of glomerulonephritis. In this study, we assessed the effect of TGFβ on the production of complement inhibitory activity by HMC. HMS were grown to confluence in monolayer in DMEM and supplemented with different concentrations of TGFβ or IL1. The superntants were collected and dialyzed against complement fixation diluent (CFD). The inhibition of the 50% lysis of sensitized sheep erythrocytes by dialyzed supernatants was assayed. The results were expressed as percent inhibition of culture supernatants relative to the lysis in control dialyzed medium. The results showed that TGFβ decreased the production of complement inhibitory in a concentration dependent fashion (TGFβ ng/ml; 0 ng/ml 41%; 1ng/ml 44%; 5 ng/ml 21%; 10 ng/ml 13%), while as a control, IL1 increased the production (3 ng/ml IL1; 51%). In conclusion, HMC are able to secrete certain amount of complement inhibitory activity and TGFβ can suppress its production. Considering the role of complement regulatory proteins in protecting cell from complement induced injury, the suppressive effect of TGFβ might be harmful in the process of glomerulonephritis.

Effects of dexamethasone on the proliferation and collagen synthesis of mesangial cells. *Zhang Ying, Liu Xuehui and Yang Jiyun. Department of pediatrics, the First Clinical School of Medicine, Beijing Medical University, Beijing* 100034, *China.* Glucocorticoids have been widely used in the treatment of glomerular diseases. The aim of the present study was to investigate the effects of dexamethasone on the proliferation and collagen synthesis of mesangial cells in vitro. Material and methods: SD rats, weighing 150-200 g were used. Mesangial cells were prepared by classical method. The purity and characteristic of mesangial cells is identified by immunofluoresence method and morphology. The second passage cells were used. After treating by trypsin and (0.025%) EDTA (0.02%) soluton, the MS were transferred to 96-well cluster dishes (MSI) or 24-well tissue culture plates (MSII) at the density of 5×10^3/ml. After MSI had been cultured without FCS for 12 hours, dexamethasone was added at the concentration of 250, 1000, 4000, 10000 ng/100μl, cultured with 20% FCS for 24 hours. Then H-TdR were added and cultured for 24 hours. Then the incorporation of H-TdR was counted (cpm). MSI cells were cultured in medium with 20%

FCS and different doses dexamethasone for 7 days. The supernatant and the cell pallets digested with collagenase were collected for measuring hydroxyproline by spectrography.

The results is shown in the following Table.

Dex (ng/well)	n	H-TdR (cpm)	n	Hydroxyproline (μg/ml)
Control	5	3379.6±1292.9	3	10.2±0.46
250	5	687.8±242.8	3	11.6±0.57
1000	5	2685.0±1044.5	3	12.5±0.62
4000	5	1324.0±936.3	3	7.2±0.95
10000	5	675.6±242.9	3	7.1±1.23

Conclusion: dexamethasone showed significantly inhibited effect on the MS proliferation at the concentration of 250, 4000, and 10000 ng/100μl, and also significantly inhibited effects on the synthesis of collagen at higher doses of 400 and 10000 ng/100μl ($P<0.05$).

Effects of HrIL-1ra on the proliferation and synthesis of collagens in glomerular mesangial cells (GMC). *Liu Xuehui, Yang Jiyun, Zhang Ying, Ma Dalong and Di Chunhui. Department of Pediatrics, the First Clinical School of Medicine, Beijing Medical University, Beijing* 100034, *China.* IL-1 is believed to play an important role in the pathogenesis of glomerulonephritis. Recenttly, IL-1 receptor antagonist (IL-1ra) has been purified, sequenced and cloned. Using glomerular mesangial cells (GMC) culture, H-TdR incorporation and measurement of hydroxyproline, we observed the effects of HrIL-1ra on the proliferation and the synthesis of extracellular matrix-collagens induced by HrIL-1β in GMC of rats. GMC were prepared by classical method. The 2nd passage of GMC were used. The GMC were transferred to 96-well flat-bottomed cluster plates (GMCI) or 24-well cluster plates (GMCII) at a density of 5×10^3 cells per well. After GMCI had been cultured with serum-free medium for 12 hours, the cells were treated with HrIL-1ra (20ng per well) for 15 minutes, and then incubated for 24 hours with different doses of HrIL-1β. Then H-TdR (0.5μCi/well) were added and cultured for a further 24 hours. Incorporated H was counted by a liquid scintillation counter. The results were recorded as CPM. GMCII were also pretreated with HrIL-1ra (20ng per well) for 15 minutes and incubated with different doses of HrIL-1β for 3, 7 and 12 days, respectively. The supernatant and cells lysate digested with collagenase were collected for measurement of hydroxyproline by spectrography. The results showed that: 1. HrIL-1β (5-50ng/well) could promote the GMC proliferation and 10-20ng/well could promote GMC synthesis of collagen while HrIL-1ra (10-1000 ng/well) itself did not show such effect on GMC. 2. HrIL-1ra could antagonize the proliferation and collagens synthesis induced by HrIL-1β. Its dosage antagonizing to the proliferation was 2-50 folds of the HrIL-1β, and to the collagen synthesis was 25-50 folds of the HrIL-1β. It suggested that HrIL-1ra might be used to treat glomerulonephritis initiated by IL-1β.

Inhibiting effect of human recombinant interleukin-10 on proliferation of human mesangial cell induced by ET-1. *Zhao Hui, Lu Min and Wang Haiyan, Department of Nephrology, First Teaching Hospital, Beijing Medical University, Beijing, China.* Interleukin-10 (IL-10) decreases the production of IL-1, IL-6 and TNFα in vitro neutralization of IL-1 in mice leads to elevation of these monokines. IL-10 also protects mice from lethal endotoxemia. Endothelin-1 (ET-1) induces proliferation of mesangial cells (MCs), which is related to the elevation of TNFα, PDGF. We tested here whether rhIL-10 might suppress proliferation of human MCs by ET-1. H-TdR incorporation was used to measure DNA synthesis. Before stimulation, medium was deprived of serum for 24 hours to keep human MCs into Go phase.

		n	H-TdR incorporation (cpm) X±Se
ET-1	10^{-8}M	6	1228.2±42.5
ET-1	10^{-8}M+IL-10 1ng	6	809.5±38.9*
ET-1	10^{-8}M+IL-10 10ng	6	610.8±49.1*
ET-1	10^{-8}M+IL-10 100ng	6	589.5±49.0*
ET-1	10^{-8}M+IL-10 1000ng	6	516.1±29.5*

* compare with control, $P<0.05$.

We found that 1) ET-1 increases H-TdR incorporation in dose manner and reaches the highest value at 10^{-8}M ET-1; 2) IL-10 may inhibit proliferation of human MCs induced by ET-1; 3) IL-10 does not stimulate DNA synthesis of Go phase human MCs.

Inhibiting effect of Emodin on the fibronectin production of cultured human mesangial cells. *Yao Jian and Li Leishi. Institute of Nephrology, Jinling Hospital, Nanjing, China.* Increased mesangial cell proliferation and accelerated synthesis of extracellular matrix are the common patholgoical features of various types of human and animal experimental glomerulonephritis. Our previous studies have shown that Emodin (the essential ingredient of Rhubarb) inhibited mesangial cell proliferation both in

vitro and in vivo. In this study, the effect of Emodin on the synthesis of fibronectin (Fn) was examined. Human mesangial cells (hMC) were cultured in 10% FCS-DMEM supplemented with various concentrations of Emodin for different period of time (24-72hrs). Cell proliferation was judged according to H-thymidine uptake. Fn secretion and deposition in hMC with or without TGFβ stimulation were examined by ELISA and immuno-fluorescence techniques. The hillock formation (an in vitro sclerotic model) made by confluently cultured hMC was detected, counted and photographed under microscope. Emodin dose dependently inhibited hMC proliferation, delayed and lessened the formation of hillock (Emodin 0μg/ml 172±17, 5μg 159±10, 10μg/ml 65 ±5.5, 20μg/ml 32±3.5; hillock No/well). The amount of Fn in the supernatants of hMC decreased significantly after exposure to Emodin (Emodin 0μg 2.44±0.65, 5μg/ml 2.02±0.31, 10μg/ml 1.04±0.06, 20μg/ml 0.25±0.10; μg/ml). Fn deposition in Emodin-treated cell with or without TGFβ stimulation was also significantly lessened by both ELISA assay and immunofluorescence staining. In conclusion, Emodin inhibited mesangial cell proliferation and decreased extracellular matrix production. These beneficial effects of Emodin might contribute to the therapeutic efficacy of Rhubarb in retarding the progress of chronic renl failure.

Growth factor stimulation of mitogen activated protein kinase is inhibited by cAMP and PGE_2 in rat renal mesangial cells. *Li Xiaomei, L. E. Heasley, R. W. Schrier and R. A. Nemenoff. Division of Renal Diseases and Hypertension, Department of Medicine, University of Colorado Health Sciences Center, Denver, CO.* Activation of the mitogen-activated protein kinase (MAPK) pathway has been shown to occur in renal mesangial cells following stimulation by polypeptide growth factors, vasoconstrictors and phorbol esters. This pathway is believed to play a critical role in normal and pathophysiologic proliferation of these cells. Recent studies have shown that MAP kinase activation by growth factors in other cell types involves activation of the low molecular weight G-protein ras and the protooncogene serine kinase c-raf. Activated raf then phosphorylates MAAP kinase kinase (MEK-1), which in turn phosphorylates and activates MAP kinase. In this study the role of this pathway in rat renal mesangial cells was assessed. MAP kinase activity was determined by phosporylation of the specific substrate myelin basic protein, and by immunoblotting with anti-phosphotyrosine antibodies. Growth factors acting through tyrosine kinase receptors (EGF, PDGF), as well as phorbol ester (PMA) repidly activated MAP kinase in these cells. Raf-1 activity was measured by immunoprecipitation with anti-raf antibodies and phosphorylation of recombinant MEK-1, which had been mutagenized at the ATP binding site. EGF and PDGF, but not PMA were able to activate c-raf-1 activity. Elevation of intracellular cAMP by treatment of cells with forskolin or by stimulation with the inflammatory mediator PGE2 markedly blunted activation of MAP kinase induced by EGF and PDGF, but not by PMA. Consistent with this observation, both forskolin and PGE2 abolished the growth factor-induced activation of raf. Thus MAP kinase activation can occur by at least two separate pathways in mesangial cells. Tyrosine kinase receptors activate MAP kinase through activation of raf. This pathway can be blocked by elevation of cAMP, presumably by interfering with the ability of ras to activate raf. In addition, activation of protein kinase C by phorbol esters can activate MAP kinase in a raf-independent manner. This pathway is not sensitive to inhibition by cAMP. It is likely that activation of each of these pathways, while both resulting in a stimulated MAP kinase will have different physiologic consequences in mediating mesangial cell growth. The activation of MAP kinase without activation of ras/raf may play a role in the observed hypertrophic responses of mesangial cells to vasoconstrictors, as opposed to the mitogenic response following ras/raf activation by growth factors.

The effect of traditional Chinese medicine astragalus root on production of cytokines and pathologic changes of the kidney in MRL-lpr/lpr mice. *Lu Yingjie, Chen Xiangmei and Liu Chenggui. Department of Nephrology, General Hospital of PLA, Beijing, China.* MRL-lpr/lpr mice spontaneously develop a systemic autoimmune disease, 36 MRL-lpr/lpr mice were divided into 3 groups; one without treatment, two groups treated with astragalus root (crude drugs 200mg/kg, 400mg/kg, respectively). 7MRL+/+ mice were taken as normal control. Our experiment took 10 weeks. Bioactivity of lpr positive cell groups was detected with double staining method by flow cytometry. Serum levels of IL-1, IL-6 and TNFα were measured with a solid phase enzyme-linked immunosorbent assay (ELISA). The renal pathology of the mice was also examined. Results showed that lpr positive cell groups were suppressed in astragalus treated groups (12.6±6.0, 14.8±3.8, vs 23.5±2.1, $P<0.05$). The serum levels of IL-1, IL-6 were raised and TNFα were depressed after the treatment. IL-1; 0.230±0.016, 0.237±0.018 vs 0.200±0.0923, $P<0.05$; TNFα; 0.299±0.029, 0.294±0.023 vs 0.438±0.036 $P<0.05$. It was also found that the renal lesion of the mice was ameriolated in treated groups ($P<0.05$). The conclusion is that astragalus root can regulate

immunologic function, reduce lpr positive cells and alleviate the renal pathologic changes of the MRL-lpr/lpr mice.

Effects of traditional Chinese medicine-Bupleuri Radix on proteinuria induced by MonAb 5-1-6. *Li Ping. China Academy of TCM, Beijing, China; F. Shimizu. Medical School of Niigata University, Niigata, Japan.* A single intravenous injection of MonAb 5-1-6 to Wistar rats had been found to cause massive, though transient, proteinuria. Immunoelectron microscopy using immunoperoxidase with the avidin-biotin complex and immunogold staining indicates that MonAb 5-1-6 binds in vitro to the surface of glomerular epithelial foot processes, mainly to slit diaphragms. 14 female Wistar rats were divided into two groups. 70mg/kg body weight of Bupleuri Radix or Phosphte buffered saline (PBS) as a control were intraperitoneally injected every day from 5 days before intravenous injection of MonAb 5-1-6 to the end of the experimental periods. Proteinuria on the 1st, 3rd, 5th and 8th day after the intravenous injection were quantitatively and qualitatively analyzed as Biuret method and SDS-PAGE respectively. Rat kidneys cut with a cryostat were stained with FITC-conjugated anti-mouse immunoglobulin. Results showed that the amount of urinary protein excretion was significantly suppressed in Bupleuri Radix group. On the third day it was 4.1 $\pm$3.0 vs 39.8$\pm$21.8, on the fifth day, 6.6$\pm$3.6 vs 59.7$\pm$31.7 ($P<0.05$). There was no difference of urinary protein qualitative analysis between two groups. Granular pattern for mouse immunoglobulins along the glomerular capillary wall was suppressed in rat kidneys from Bupleuri Radix-treated group by direct immunofluorescence. Conclusion showed that Bupleuri Radix can suppress proteinuria and alleviate renal lesion induced by MonAb5-1-6.

Clinical evaluation of SPECT in detecting glomerular filtration rate (GFR) and effective renal plasma flow (ERPF). *Liu Jia, Zhang Lixia and Wang Xiaoyun, et al. Department of Nephrology, The First Affiliated Hospital, Nanjing Medical University, Nanjing, China.* The GFR and ERPF were detected with single photon emission computerized tomography (SPECT) in 198 patients with renal diseases. There was good correlation between GFR and creatinine clearance (Ccr) ($r=0.9$, $P<0.0005$), correlations of themselvs showing $r=0.93$ ($P<0.0005$), $r=0.63$ ($P<0.001$) respectively. According to the GFR, 45 patients with diabetic nephropathy were divided into two groups: group A (low GFR) and group B (normal GFR). The ages (60$\pm$9.2 years old) of group A were higher than that of group B (4512.9 years old) ($P<0.05$). The incidence of complications with proteinuria (54%) and hypertension (72%) in group A was significantly higher than those (15%, 20%) in group B ($P<0.05$ and $P<0.005$). However, the duration had no difference in two groups ($P>0.05$). Seven of 20 patients with hypertension showed single GFR decreasing, three of them were diagnosed as having renal artery stenosis, which was evidenced by renal angiography and so on, and another four were suspected of single renal atrophy. The results showed that the decreases of GFR in patients with diabetic nephropathy were related to proteinuria, hypertension and ages. Single renal disease can be distinguished by determination of single renal function, so it is suggested that the indications of ECT in detecting GFR should be increased in patients with hypertension.

The variation of immune function in Rat BSA nephritis. *Chang Ping. Department of Nephrology, Zhujiang Hospital, The First Military Medical College; Liao Lisheng. Department of Nephrology, Xinqiao Hospital, The Third Military Medical College, China.* To identify the role of RBC immune system in glomerulonephritis, we infused BSA intra-abdominally into 40 preimmunized rats which were killed in tens on the 1st, 7th, 13th and 20th day to test the relative indexes, and obtained the following data. RBC-C_3bRR on the 1st, 7th, 13th and 20th day is 20.44$\pm$3.42, 17.13$\pm$3.35, 13$\pm$3.26 and 15.13$\pm$2.85 respectively, and is lowering remarkably on the 7th, 13th and 20th day ($P<0.05$). RBC-ICR rises notably in the course of nephritis (compare the data from the 13th day with those from the 1st, $P<0.05$). So did the CIC concentration. Relativity analysis shows that CIC concentration is notably negative with RBC-C_3bRR and notably positive with RBC-ICR. The lowering of RBC-C_3bRR and the rise of RBC-ICR demonstrate the drop of RBC immune adherence function, indicating that the drop of RBC immune adherent function is somewhat associated with the rise of CIC concentration. The increase of CIC concentration and deposition in glomerulus is one of the main mechanisms of BSA nephritis. The experiment result suggests that there should be some relationships between the RBC immune function and the mechamism of BSA nephritis.

Renal mobilization of dopamine in response to sodium loading in patients with essential hypertension. *Hou Fanfan, Zhang Xun and Wang Li. Department of Nephrology, Nanfang Hospital, Guangzhou, China.* Renal mobilization of dopamine (DA) in response to sodium loading was studied in patients with essen-

tial hypertension. Seven patients aged between 56-65 years (Group A), 7 age-matched normal controls (Group B) and 10 healthy young volunteers (Group C) were enrolled in this study under metabolic balance conditions over a 8-day period, in which dietary sodium intake was increased from 34 mmol to 170 mmol per day. Normal subjects (B and C) showed a prompt rise in urine DA output when given sodium loading, but the magnitude of DA increased in Group B was less than that obtained in Group C. In contrast the urine DA excretion in patients with essential hypertension showed an initial fall followed by a return to baseline values. The changes in urine sodium output in the three groups were parallel to urine DA excretion. Neither group showed a change in plasma DA, Ccr, and blood pressure, but the patients in Group A showed a rise in plasma sodium, a decrease in hematocrit and a greater weight gain on sodium loading. The plasma renin activity and aldosterone were less suppressed in hypertensive group, although the difference was not statistically significant. These results suggested that the renal mobilization of DA should be age related. The patietns with essential hypertension have a fault in renal DA mobilization when given sodium loading. This defect may be important in relation to renal sodium handing by patients with essential hypertension.

Morphologic and molecular evidence of apoptosis during the reperfusion phase after brief periods of renal ischemia. *Liao Hongjun, Chen Xiangmei and Dong Ke. Department of Nephrology, General Hospital of PLA, Beijing* 100853, *China.* A multiparametric analysis demonatrates that even breif period of ischemia can initiate extensive loss in a rat kidney through the process of Apoptosis during early reperfusion. Microscopic examination of mouse renal tissues subjected to a 5-, 30-, or 45-minute period of complete ischemia showed the presence of apoptotic bodies both within and occasionally between renal tubular, appearing as early 6 hours after reperfusion and increasing in numbers at 12 hours. Furthermore, DNA extracted form such reperfusion renal tissue demonstrated the appearance of a distinct "ladder pattern" of DNA fragments after electrophoreis in agarose gels. It was suggested that reanl reperfusion injury after ischemia could initiate a form of cell death-Apoptosis that is dramatically different from cellular necrosis induced by prolonged severe ischemia.

Effects of various bioactive substances on intracellular calcium of human glomerular endothelial cells. *Yu Lifang, Chen Xiangmei and Xu Qihe. General Hospital of PLA, Beijing, China.* Endothelial cell may play an important role in the pathogenesis of glomerulonephritis. In this study, laser scanning confocal microscope and Ca^{2+}-specific fluoresecence indicator Fluo-3 were used dynamically to observe the effects of following bioactive substances on the intracellular calcium ion (iCa^{2+}) of single human glomerular endothelial cells: endothelin-1 (1μg/ml), IL-6 (1ng/ml), IL-1 (0.1μg/ml), TXB_2(0.16μg/ml), 6-keto-PGF (0.1 μg/ml), PGE_2(0.1μg/ml), ATP (1mmol/L), saponin (5μg/ml), angiotensin II (10μg/ml). *Results*: (1) iCa^{2+} increased slightly within 20 seconds after endothelin-1 stimuli, then iCa^{2+} decreased gradually. (2) Perinuclear cytosolic iCa^{2+} was higher than nuclear iCa^{2+} under unstimulated condition. After IL-6 stimuli, nuclear iCa^{2+} increased and perinuclear cytosolic iCa^{2+} decreased, until the iCa^{2+} of the whole endothelial cell became almost equal. (3) iCa^{2+} changes after IL-1 stimuli could be divided into 4 stages: ① non-response within 50 seconds after stimulation; ② decreased dramatically within 50～70 seconds; ③ decreased gradually, within 70～200 seconds; ④ recovered slowly 200 seconds after stimulation. (4) iCa^{2+} elevated slightly within 25 seconds after ATP stimuli, then both nuclear and cytosolic iCa^{2+} decreased gradually to a extremely low level. (5) Both nuclear and cyto-solic iCa^{2+} increased transiently and recovered within 50 seconds after TXB_2 stimuli. (6) iCa^{2+} changes after PGE_2 stimuli could be divided into 4 stages: ① dramatic decrease; ② platform stage; ③ slow decrease; ④ recovery. (7) iCa^{2+} decreased dramati-cally within 15 seconds after angiotensin II stimuli, and decreased gradually thereafter. (8) Saponin, as a cell membrane perforation agent, could delete the iCa^{2+} quickly. (9) 6-keto-PGF had no significant influence on iCa^{2+}. *Conclusion*: the data obtained will be helpful to further study on the cytosolic iCa^{2+} thereby the function changes of human glomerular endothelial cells.

Effects of Lipid Peroxidation of Lead on the kidney of rat. *Ma Jianfei and Zhou Xijing. Department of Nephrology, the First Clinical College, China Medical University, Shenyang, China.* Lead was continuously administrated to rats through drinking water (with lead acetate, 1500 mg/L). The rats were then killed at the end of 1, 2, 4, 6, 8 weeks respectively, and kidneys were taken for measuring the relative indexes of lipid peroxidation. The results showed that the level of malondialdehyde (MDA) was significantly increased in the first 6 weeks and this condition was not affected by obviously elevated content of glutathion and the activity of glutathion peroxidase. The activity of superoxide dismutase varied with the course of time (inhibited in the first 2 weeks and activated by the end of 6 weeks). The present data demonstrated that lead might cause lipid peroxidation in kidney of

rat and suggested that O_2^- should be a key factor initiating the reaction.

Induction of systemic hypertension and renal damage by chronic blockage of nitric oxide synthesis in the rat. *Yang Junwei and Li Leishi. Institute of Nephrology, Jinling Hospital, Nanjing, China.* The basal level of nitric oxide (NO) released by vascular endothelial cells plays an important role in the regulation of blood pressure (BP) and renal function. Recent studies have indicated that acute inhibition of NO synthesis in the rat promotes arterial hypertension and renal vasoconstriction. In this study, we evaluated the renal and systemic effects of chronic blockage (4-weeks) of NO synthesis by oral administration of NO synthesis inhibitor, N^G-nitrol-L-arginine methyl ester (L-NAME, 25 and 50 mg/dl) on SD rats. Age-matched untreated rats were used as controls. Urinary NAGase excretion rate and 24-hr urinary protein excretion rose progressively in L-NAME treated rats, reaching 81.3±24.6 U/g. Cr and 48.6±15.4 mg/24h respectively at 4 weeks, while only 11.5±5.3 u/g. Cr and 6.7 ± 2.2 mg/24h in controls. L-NAME treated rats presented marked hypertension, renal vasoconstriction and hypoperfusion, as well as increase in MAP (from 108±4 to 136±8 and 159±5 mmHg, respectively, at 4 weeks), 34.7% fall in glomerular filtration rate and 15.5% increase in filtration fraction. Plasma angiotension 11 level also elevated after L-NAME administration. Morphologic examination revealed that there was significantly severe glomerular injury in the chronically NO-blocked rats vs controls. Conclusion: chronic nitric oxide blockade may constitute a new model of severe arterial hypertension. Activation of the RAS may account, at least in part, for the vasoconstriction activity after such inhibition.

The possible mechanism of hypertension related to r-HuEPO in rats. *Dong Fei, Hao Chuanming, Zhou Jianghua, Lin Shanyan. Huashan Hospital, Shanghai* 200040, *China.* Mechanism of hypertension related to the treatment with r-HuEPO are not completely elucidated. In this study, the experimental SD rats (E) received subcutaneous r-HuEPO 150U/kg tiw and the control rats (C) received the same volume 0.9% Nacl. Three weeks later, the blood pressure (BP) and hematocrit (Hct) raised significantly in E (Hct 66.82±1.96%, BP 140.00±3.57 mmHg, $N=11$) compared with C (Hct 47.50±1.5, BP 116.40±2.65. $N=11$, $P<0.01$). The plasma endothelin (ET) level in E remained the same as C (E 177.81±8.35 pg/ml, $N=11$; C 178.26±9.06, $N=11$, $P=$NS). In isolated anterior mesenteric arteries experiment, ET and norepinephrine (NA) caused a dose-dependent response of arteries both in E and C. However the Ec_{50} in E were significantly lower than in C (ET: 2.82±0.45nM, $N=5$; 5.03±2.26, $N=7$; $P<0.05$. NA: 74.88±12.63nM, $N=6$; 267.11±56.80. $N=8$; $P<0.05$). No significant difference in Emax for ET and NA was found between E and C. The plasma renin activated (PRA), angiotensin II plasma level (AII) in E was similar to C (PRA: 5.16 ±0.52, $N=11$; 6.32±0.92, $N=11$, $P=$NS. AII: 1885.36 ±317.89, $N=11$; 1310.65±228.48, $N=11$; $P=$NS). The sensitivity of arteries to AII in E was lower than that in C; and r-HuEPO had no direct contractile effect on rats anterior mesenteric and aortic anteries. The ANP lasma level in E was also similar to C (91.51±11.49 ng/ml, 113.37±20.91, $N=11$, $P=$NS). We conclude (1) there was no direct vasopressor effect of r-HuEPO on anterior mesenteric arteries and aortic arteries. (2) The plasma ET, PRA, AII, ANP levels did not differ significantly between r-HuEPO treatment rats and control rats. (3) The sensitivity of anterior mesenteric arteries to ET and NA in r-HuEPO treated rats were significantly higher than that in the control rats. (4) The sensitivity of anterior mesenteric arteries to AII in r-HuEPO treated rats was lower than that in the control rats.

Central AII effects on renal function mediated through area postrema (AP). *Peng Ai, Lin Shanyan, Hao Chuanming, Li Peng*, and Zhou Jianghua. Division of Nephrology, Huashan Hospital, Shanghai Medical Universityy; * Department of Physiology, Shanghai Medical University, Shanghai* 200040, *China.* It's well known that AP as well as its adjacent element NTS plays a key role in the regulation of cardiovascular system. Recently many evidences suggest that damage of AP could prevent or diminish the occurrence of experimental hypertension. It has been found that AP has a receptor and can sense directly the change of AII level in blood. In this study, we used microinjection of various amounts of AII into AP in SD rats and observed the renal hemodynamic changes. We found injecton of NS 50μl to AP resulted in no change of GFR, RPF, urine volume and UNaV in 6 rats. Injection of 2ng AII to AP in 6 rats increased GFR (0.89±0.05 vs 1.39±0.13 $P<0.05$), RPF (3.36±0.28 vs 5.79±0.61 $P<0.01$), UNaV (0.91±0.18 vs 1.72±0.37 $P<0.01$). 20ng AII injection in 8 rats resulted in similar change as did by 2ng AII (GFR 0.94±0.04 vs 1.66± 0.15 $P<0.01$; RPF: 3.58±0.24 vs 6.52±0.56 $P<0.001$; UNav: 1.24±0.18 vs 2.32±0.38 $P<0.01$). However, injection of 200ng AII into AP in 8 rats caused opposite changes as did by low dose AII injection (GFR: 0.87±0.03 vs 0.60±0.12 P

<0.05; RPF: 3.79 ± 0.19 vs 2.49 ± 0.32 $P<0.01$; UNaV: 1.02 ± 0.12 vs 0.68 ± 0.09 $P<0.05$). Injection of 20ng AII into NTS in 6 rats caused no changes of GFR, RPF and UNaV. Prior injection of saralasin to 20ng AII usage in 4 rats abolished above AII effects on GFR, RPF and UNaV (0.90 ± 0.06 vs 0.92 ± 0.08; 4.08 ± 0.31 vs 3.72 ± 0.14; 0.86 ± 0.18 vs 0.90 ± 0.22 $P=$NS). One kidney denervation also alleviated 20ng AII effect on GFR, RPF compared with that intact kidney (GFR: 0.85 ± 0.12 vs 0.54 ± 0.06 $P<0.05$; RPF: 2.16 ± 0.08 vs 1.45 ± 0.07 $P<0.05$). Our results indicate: 1) direct microinjection of AII on AP can influence renal hemodynamics. Low dose increases GFR, RPF, UV, UNaV and high dose causes opposite changes. 2) NTS has no direct effect on AII-induced above changes. 3) influence of central AII on renal function through AP is mediated by renal nerve.

Effect of acute and chronic stress on arterial pressure and renal function in conscious rats on high sodium diet. *Zou Wenquan, Lin Shanyan, Hao Chuanming, Zhu Danian*, and Li Peng*. Division of Nephrology, Huashan Hospital, Shanghai Medical University; * Department of physiology, Shanghai Medical University, Shanghai* 200032, *China.* This study is to clarify the effect and the mechanism of the stress and high sodium diet (HNa) on cardiovascular and renal function in rats with no genetic predisposition to develop hypertension. The experiments were performed in control (C), stress (S), HNa and stress plus HNa (S+HNaa) conscious Sprague-Dawley rats respectively. Rats were fed either a 1% or an 8% sodium diets beginning at 5 weeks of age and exposed to chronic stress (electric foot shock and noise) from 11 to 12 weeks of age. Weekly blood pressure measured by a tail-cuff method showed that by 13 weeks of age, the increase in systolic blood pressure was higher in S (155.0 ± 2.8mmHg, $P<0.01$), S+HNa (171.1 ± 11.4mmHg, $P<0.01$) and HNa group (136.6 ± 4.1mmHg, $P<0.01$) than in C group (117.4 ± 2.5mmHg). By 13 weeks of age, renal function and renal sympathetic nerve activity (RSNA) were examined and its responses to acute stress (noise stress) delivered at 5 hours after surgical preparation were also observed. Renal plasma flow (RPF) was remarkably decreased in S+HNa compared with that of control (1.42 ± 0.23ml/min $\cdot$ $100g^{-1}$ vs 4.14 ± 0.23ml/min $\cdot$ $100g^{-1}$, $P<0.01$). The HNa group had a clearly higher urinary sodium excretion (UNaV) as compared to that of control (13.1 ± 0.7 vs 4.7 ± 0.2 μEq/min, $P<0.01$). Arterial pressure was rapidly elevated during the first 6 seconds after acute stress in all 4 groups, especially in HNa group, and folloed by steady decline towards the baseline. The RPF significantly decreased in C (Δ 1.96 ± 0.16 ml/min $\cdot$ $100g^{-1}$, $P<0.01$), s (Δ 1.45 ± 0.23 ml/min $\cdot$ $100g^{-1}$, $P<0.01$) and HNa group (Δ 1.10 ± 0.30 ml/min $\cdot$ $100g^{-1}$, $P<0.01$), but not in S+HNa group (Δ 0.42 ± 0.18 ml/min $\cdot$ $100g^{-1}$, $P>0.05$) during acute stress procedure. Acute stress declined UNaV in C ($\Delta1.50\pm0.38\mu$Eq/min, $P<0.01$), HNa ($\Delta1.82\pm0.81$ μEq/min, $P<0.05$) and S+HNa group ($\Delta0.50\pm0.15\mu$Eq/min, $P<0.01$). The responses of RSNA to acute stress were greater in HNa ($\Delta81.5\pm5.2\%$, $P<0.05$) than in C ($\Delta57.3\pm6.4\%$). In conclusion, 1) chronic stress and high sodium intake each can induce chronic hypertension in rats without genetic predisposition to become hypertensive, 2) exposure to both an 8% sodium chloride diets and chronic stress produce additive increase in arterial pressure, and 3) increased NaCl intake and stress may interact to alter renal hemodynamics, which might contribute to the development of hypertension.

r-HuEPO induced hypertension having no relationship with function of Area postrema (AP). *Fan Shuling, Lin Shanyan, Gu Yong and Zhou Jianghua. Division of Nephrology, Huashan Hospital, Shanghai Medical University, Shanghai* 200040, *China.* As r-HuEPO developed into clinical usage, its therapeutic effects were tremendous. However, the main problem encounted clinically is its relation with development or worsening of hypertension. Several factors were considered including increase of peripheral vascular resistence induced by sensitivity change of blood vasculature to certain neural and humoral factors. It is already known that AP as well as its adjacent nucleus is important in regulating cardiovascular function. To clarify the possible role of AP in r-HuEPO related hypertension, we performed following studies. 200-300g male SD rats were used. AP ablation (APX) was done by electric burn, and sham operation (SO) also done. After 5 days recovery from surgery, these animals received 150 U/kg BW subcutaneous injectioin qod for 3 weeks. Control group (C) received same amount of NS injection. All animals received tail vessels blood pressure recording. At the end of experiments GFR (ml/min/100gBW, inulin clearence), RPF (ml/min/100gBW, PAH clearence), urine sodium excretion (UNaV, mmol/min/100gBW) measurements were taken under anesthetic condition. The results were: 1) after 3 weeks r-HuEPO injection, both APX and SO group had similar blood pressure increment, from 111.3 mmHg to 132.8 and 114.6 to 134.3 respectively; no BP change was found in C group. Hct in APX 60%, SO 59.7%, C 47.8%. 2) lowering of GFR, RPF, UNaV were found both in APX and SO group as compared to C group, GFR (0.50 ± 0.06, 0.48 ± 0.06, 1.00 ± 0.11 $P<0.01$), RPF (1.64 ± 0.15, 1.71

±0.12, 2.93±0.06 $P<0.01$), UNav (0.15±0.07, 0.13±0.02, 1.13±0.11 $P<0.01$). The results indicate that r-HuEPO could lead to hypertension and this phenomenon has no relationship to the function of AP. Chronic injection of r-HuEPO inducing renal hemodynamic changes may play a part in the pathogenesis of this type of hypertension.

Effects of area postrema (AP) on renal hemodynamics and sodium balance in DOCA hypertensive rats. *Lin Shanyan, Ni Dawen, Gu Yong. Division of Nephrology, Huashan Hospital, Shanghai Medical University, Shanghai* 200040, *China.* Area postrema (AP) is an important center in regulating cardiovascular and water-electrolyte homeostasis in the body. AP ablation (APX) could prevent hypertension induced by chronic injection of AII or ameliorate DOCA induced hypertension. It is also found that AP plays a role in the regulation of renal nerve activity. This study was designed to observe effects of AP ablation on renal hemodynamic changes in DOCA treated animals. Male SD rats weighing 200-300g were used. AP ablation was done by electric burn and sham operation (SO) was also done. Three days later, subcutaneous DOCA injections 5mg/week were given. The rats were kept in metabolic cage for 5 weeks with 1% NaCl. Sodium intake and excretion as well as tail vessel blood pressure were recorded. At the end of 5th weeks, all animals were under clearance study in anesthetic state. GFR was measured by using inulin clearence, RPF by PAH clearence. The results are as follow: APX per ce had no influence on GFR, RPF, UNaV, UV as compared with SO; (GFR; 1.02±0.08ml/min/100gBW vs 0.89±0.07; RPF; 2.81±0.56 ml/min/100gBW vs 2.58±0.28; UNaV; 1.58mmol/min/100gBW vs 1.19±0.45; UV; 5.3±0.12μl/min/100gBW vs 4.6±0.24; P=NS). After DOCA administration, APX group had lower increment of BP than SO. At 5th weeks, BP were: APX 113.5±7.5mmHg vs SO 138.5±5.5, $P<0.01$. At the 3rd week, sodium retention was less severe in APX group, at the 5th week the difference reaches null between two groups. GFR, RPF, UNaV, UV at 5th week were a little bit higher in APX group but statistically no difference was found. These results show that AP ablation can improve DOCA induced sodium retention to some extend, implying that AP plays a role in DOCA induced hypertension.

Possible role of endothelin in two-kidney two-clip hypertension model. *Zheng Zhihua and Ye Rengao. Kidney Research Institute, Sun Yat-sen University of Medical Sciences, China.* In this study, 80 SD rats, 120-160g in weight were randomly assigned to two groups: hypertension group and control group. Two-kidney, two-clip hypertension rat's model was made in hypertension group. Renal artery was only made separated in control group. We observated the blood pressure (BP) of rail artery weekly after operation and measured activity of endothelin (ET) in plasma and renal tissue in the 1st, 4th, 8th and 12th week. Plasma samples were extracted by sep-pak C18 cartridges and assayed by radio extracted by sep-pak C18 cartridges and assayed by radio immune assay (RIA). Tissue samples were assayed by RIA directly. As a result, BP began to rise in the first week and continued increasing upto a high stable level. Activity of plasma ET increased a little in the first week (8.32±1.83pg/dl vs 7.86±1.74 pg/dl $P>0.05$) then rose significantly (11.02±2.04 vs 7.25±1.82 $P<0.01$) in the 4th week but declined after the 8th week (5.12±1.31 vs 8.04±1.68 $P<0.05$). Level of ET in renal tissue appears to be positively correlated with plasma ET ($r=0.68$ $P<0.05$). Our data demonstrated that levels of ET were varied significantly in different phases in 2k2c hypertension. It might be renal artery stenosis which induced vascular contraction and endothelium ischemia and stimulated endothelium cells to secrete ET. Then it induced vascular contraction strongly and resulted in BP rising progressively in actue phase. Endothelium cells were severely iachemic when BP continued in a high level of BP. Most of endothelium cells were necrosis so resulted in declining of ET secretion. Thus, levels of ET in plasma and tissues reduced significantly in chronic phase. Our data suggested that ET might participate in mechanism of hypertension in actual phase in 2k2c model.

Effect of NG-nitro-L-arginine on renal function and blood pressure in rats. *Yang Junwei and Li Leishi. Institute of Nephrology, Jinling Hospital, Nanjing, China.* Nitric Oxide (NO) is thought to be tonically released from the endothelium and a factor influencing vascular tone. This study was designed to test the effect of inhibition of NO production on renal function and blood pressure in rats. In protocol 1, the dose-dependent effect of intravenous infusion of NO synthesis inhibitor, NG-nitro-L-arginine (L-NA, 0.5, 1.5 and 15 μmol/100g/min) were studied in anesthetised rats. Mean blood pressure (MAP) was not altered by the 0.5 and 1.5 μmol/100g/min. The administration of 1.5 μmol/100g/min L-NA, in addition to decreasing UV, also decreased UNaV and RBF. The intravenous L-NA infusion of 15 μmol/100g/min produced significant increase in MAP and reversed the inital fall in UV and UNaV, despite decrease RBF and GFR. In protocol 2, the local effect of intrarenal infusion of L-NA (100nmol/100g/min) showed a tendency to

lessen RBF (10%), without changing GFR and MAP. Meanwhile there was reduction in UV (31%) and UNaV (23%) as compared with contralateral kidney. The renal vasodilator and excretion was caused by intrarenal injection of Ach (0.33μg/100g/min). In protocol 3, the effect of L-NA to the isolated perfused kidney has been studied. At 100μmol/L of L-NA, both UV and UNaV were decreased as compared with the control period ($P<0.05$), and other hemodynamic parameters were not altered with this concentration. From this data, we suggest that the decrease in NO production should affect renal excretion of sodium and water in the absence of any significant change in MAP. At large dose, L-NA also produces hypertension and overrides the initial antinatriuretic effects.

The effect of glycyrrhetic acid (GA) on lipid content of adrenal cortex cells: an quantitative analysis. *Zhang Ying, Liu Xuehui and Yang Jiyun. Department of Pediatrics, The First Clinical School of Medicine, Beijing Medical University, Beijing, 100034, China.* Several studies have demonstrated that glycyrrhetic acid (GA) may antagonize the inhibition on adrenal cortex caused by steroid therapy. In this study, the effects of GA on lipid content of adrenal cortex were observed quantitatively with ture color medical image analysis system (CMIAS). SD rats were devided into 7 groups. Group 1: normal control (N). Group 2: normal rats treated with GA (NG). Group 3: rats treated with Akriamycin (A). Group 4: ADR rats treated with GA (AG). Group 5: ADR rats treated with dexamethasone (AD). Group 6: ADR rats treated with dexathasone and GA simultaneously (ADGP). Group 7: ADR rats treated with dexamethasone first and then with GA (ADGT). The adrenal cortex were obtained at the end of experiment and then its section were stained by Sudan III. The lipid showed a red color and then the lipid content was measured by CMIAS 007 system. The results were expressed by A (the area of Sudan III positive) and IOD (integral optical density), as follows.

Groups	A	IOD
N	16244	1762
NG	23260	2276
A	13473	1170
AG	17490	1622
AD	10257	1012
ADGP	21319	1822
ADGT	18593	1627

These results suggest that GA could increase the lipid content of adrenal cortex cells in normal and ADR rats, and antagonize the inhibition on adrenal cortex cells caused by dexamethasone.

Pharmacokinetic studies on recombinant human erythropoietin. *Yang Shihong, Liu Ping and Wang Erjun. Institute of Nephrology, Beijing Medical University, Beijing 100034, China.* The rHu-Epo pharmacokinetics of Chinese hemodialysis patients were studied in order to administrate appropriate doses to inidividual patient. We studied rHu-Epo pharmacokinetics of intravenous (i. v.) and subcutaneous (s. c.) administration in 15 hemodialyzed patients, respectively. The mean age of 8 i. v. and 10 s. c. (included 3 i. v.) administered patients was 61±9 years and 46±19 years and the mean hematochrome was 82.7±27.2 g/l and 90.4±21.8 g/l, respectively. All patients were injected with Epoetin Alfa 50 U/kg. Following the first administration, serum rHu-Epo level at 0, 0.5, 1, 2, 8, 12 and 24 hours was measured in i. v. group and at 0, 5, 1, 2, 8, 12, 24, 48, and 72 hours respectively in s. c. group by ELISA. The concentration-time indices were analysed using 3P87 software. Thhe results are shown in Tables 1 and 2.

Table 1. The results of rHu-Epo pharmacokinetics in i. v. group

	t1/2(hr)	V(ml/kg)	Cl(ml/min/kg)	AUC(mU/ml.h)
X±SD	5.45±1.48	79.7±19.2	0.305±0.298	5295.9±3661.2

Table 2. The results of rHu-Epo pharmacokinetics in s. c. group

	tmax(h)	Cmax(mU/ml)	Cl(ml/min/kg)	AUC(mU/ml.h)
X±SD	10.2±5.7	37.2±19.2	17.6±8.1	1620.3±860.7

The results suggested that pharmacokinetics in i. v. administration could be described by a linear two-compartment model and in s. c. administration by a linear single-compartment model. The t1/2 range of i. v. group and s. c. group was 4.48—8.02 hours and 8.65—35.2 hours, respectively. This indicated that doses should be administered according to the t1/2 of patients. The t1/2 increased with the decrease of Cl. After a single s. c. dose, peak serum concentrations were only about 5% of those attained by i. v. injection of the same doses. In i. v. administed patients,

the rHu-Epo distributive volume (V) was less than extracellular fluid volume. This suggested that i. v. rHu-Epo distributes mostly in blood.

Clinical study of polyamines (PA) in red blood cells (RBC) in patients with chronic renal failure (CRF) and hemodialysis (HD). *Liu Zhangsuo, Zhang Mingxuan, Cheng Yimin and Liu Zhongming, Department of Nephrology, 1st Teaching Hospital of Henan Medical University, China.* In 18 patients with CRF and 18 healthy control subjects, erythroid progenitor cell (CFU-E) in bone marrow was cultured in vitro; erythropoietin (Epo) activity in serum was determined by ELISA; PA concentration in RBC including spermine (Spm), spermidine (Spd) and putrescine (Pu) were measured by high-performance liquid chromatography. The results showed: (1) There were no significant changes in CFU-E and Epo between the patients with CRF and the controls ($P>0.2$). (2) Changes of Epo level in post-HD were not markedly different from those in pre-HD ($P>0.5$), and there was no relationship between Epo and Hb, PCV, Cr or BUN ($r=-0.279$, -0.253, 0.083, -0.069; $P>0.1$, or 0.5). (3) Spd and Pu concentrations were significantly higher in patients with CRF than those in the controls ($P<0.001$), and lower in post-HD than in pre-HD ($P<0.005$, 0.01). There was significantly positive correlation between Spd or Pu and Cr or BUN ($r=0.664$, 0.522, 0.642, 0.564; $P<0.001$, 0.02, 0.001, 0.01), and significantly negative correlation between Spd or Pu and Hb or PCV ($r=-0.608$, -0.602, -0.647, -0.538; $P<0.002$, 0.005, 0.001, 0.01), but no correlation between Spd or Pu and Epo activity ($r=-0.164$, -0.038; $P>0.2$, 0.5). There was no significantly statistical significance in the changes of Spm ($P>0.2$ or 0.5). In conclusion, (1) No defect was found in the function of CFU-E of the bone marrow in patients with CRF. The proliferation, differentiation and reactivity to Epo were normal in CFU-E culture in vitro, (2) Epo was relatively deficient in CRF. It was not an only cause for anemia of CRF, (3) PA was sure to accumulate in RBC of CRF. So PA was one of the important factors involved in the anemia of CRF, (4) PA in the anemia of CRF could not decrease the acitivity of Epo, but could probably inhibit CFU-E directly at the cellular level of the bone marrow. This study further surports the action and position of PA on the anemia of CRF. It suggested that using rHuEpo with PA synthesis inhibitors on the basis of blood purification would provide a theoretical basis for treating anemia of CRF.

The effect of fibronectin on opsonin receptor expression by PMC obtained from uremic patients. *Hou Fanfan, Wang Li, Zhang Xun, Department of Nephrology, Nanfang Hosptial, Guangzhou* 510515, *China.* In order to explore the mechanism by which fibronectin (FN) enhances phagocytosis in uremia, several experiments were done in peripheral monocytes (PMC) obtained from 18 patients undergoing maintained hemodialysis (HD). The results showed that (1) phagocytosis of IgG antibody-coated sheep erythrocytes (mediated by the FC-receptor) and Candida albicans (mediated by the C3b-receptor) in patients were significantly lower than that in healthy controls ($P<0.01$). Nevertheless, in the presence of 80μg/ml of purified human FN, the reduced phagocytic capacity in 13 patients with low FN concentrations showed a signficant increase in C3b-receptor-mediated phagocytosis but not in the Fc-receptor-mediated; (2) FN influenced PMC binding and phagocytosis of C. ablicans through interaction with PMC and did not require the concomitant presence of the phagocytic target; and (3) to examine the possibility that FN influenced the expression of opsonin receptors on PMC, Fn-, Fc- and C3b-receptors were enumerated. The binding of ^{125}I-FN to PMC obtained from HD patients were significantly lower than that obtained from normal controls ($P<0.01$), but the defect could be corrected by increasing the FN concentration in media. There were no differences in IgG and C3b receptor number or affinity between PMC obtained from patients and from controls. Administration of FN increased the membrane expression of C3b-receptors but not of Fc-receptors. Our results showed that the cooperation between FN- and C3b- or FN- and Fc-receptor was the prerequisite for maintenance of an optimally phagocytic state in PMC. A defect in FN-receptor expression was found in HD patients, and the administration of FN enhanced C3b-receptor mediated phagocytosis by increasing the expression of FN- and C3b-receptors at the same time.

Effects of Hirudo on peritoneal phagocyte and renal pathology of rats with chronic renal failure: A computer imaging analysis study. *Lu Yingjie, Chen Xiangmei, Yu Lifang and Shi Suozhu, Department of Nephrology, General Hospital of PLA, Beijing* 100853, *China.* Anti-coagulant therapy has been proved to be effective in the management of some glomerular diseases. Hirudo is a traditional Chinese medicine with an anti-coagulating property, but whether it has therapeutic effects on peritoneal phagocytes and renal pathology of rats with renal failure is unclear. 7/8 nephrectomized Wistar rats, female, weighing 180 —200g were divided randomly into 3 groups: 1. 8 placebo-treated rats fed with running water 1ml/day; 2. Hirudo group 1, 8 rats treated with small dosage of Hirudo (crude drug 0.3g/day);

3. Hirudo group 2, 8 rats treated with big dosage of Hirudo (crude drug 0.6g/day). Control group consists of 10 healthy female Wistar rats, with a body weight of 180—200g. Phagocytosis ability of the phagocytes was detected with flow cytometry, and PAS stain renal slices were examined under microscope with the help of a computer imaging analysis system. Results: (1) Phagocytosis ability of the phagocytes in the peritoneal cavity of the 7/8 nephrectomized rats (2.08±0.67%) was significantly depressed compared with control rats (4.9±1.93%), $P<0.05$, and which could be normalized by Hirudo treatment (3.56±1.17%), $P<0.05$. (2) Glomerulus enlargement, mesangial proliferation and fibrin exudation could be reduced by Hirudo, as shown in the Table. Conclusion: Hirudo might be an effective drug to treat chronic renal failure.

Effects of Hirudo on renal pathology of 7/8 nephrectomized rats

Groups	N	Area of a glomerulus (μm^2)	Mesangial proliferation (μm^2)	Fibrin exudation (μm^2)
Control	10	8032.38±1411.35	682.96±260.81	0.0
Untreated	8	20642.38±3865.68+	11158.74±3907.51+	6528.53±2237.91+
Hirudo 1	8	13902.58±2183.25*	2839.31±883.50*	1969.49±1328.27*
Hirudo 2	8	14331.04±3536.03*	3776.30±1012.57*	3247.16±2024.64*

+: vs control group, $P<0.01$; * vs untreated group, $P<0.01$

Effects on RBC immune in uremic patients treated with recombinant human erythropoietin. *Shi Yuexian, Hou Fanfan, Zhang Xun and Jiang Jianping, Nanfang Hospital, Guangzhou, China.* There has been no report regarding the association immune deficiency of RBC in uremic patients with the decreasement of EPO production. Thirty-five uremic patients with a mean dialysis period of 7.8 months were studied. One group were treated with rHu-EPO (group A, n=15), the other without rHu-EPO (group B, n = 20). Nine healthy volunteers served as controls. RBCs were isolated from the peripheral blood and C3b receptors (C3bR) of RBC were measured by a C3bR rosette test. RBCs from 8 patients of group B were incubated with or without rHu-EPO for 72 hours. C3bR of RBC was measured pre- and post-incubation. The results showed that there was no satistical difference between group A and the controls (17.57±8.13 vs 19.33±3.75). Expression of C3bR began to increase 2 weeks after rHu-EPO treatment. Positive correlations were found between the expression level of C3bR and the course of rHu-EPO treatment and the increment of Hb ($r=0.705$ and 0.758, $P<0.01$). No correlation was found between the expression level of C3bR and the level of Hb and the period of dialysis. Expression of C3bR in group B (10.85±5.75) was significantly lower than that in group A and the controls ($P<0.01$). On RBCs from group B patients incubated for 72 hours in the medium free of auto-plasma with or without rHu-EPO, the expression of C3bR was increased (16.75±5.88, 15.75±3.62 vs 12.5±4.16, $P<0.01$) but lower than normal ($P<0.05$ and 0.01), indicating that C3bR epxression had no correlation with rHu-EPO. These suggest that expression of C3bR is lower in uremic patients, which was not related to rHu-EPO, and rHu-EPO treatment can improve the RBC immune function in uremic patients probably mediated by increasing the number of RBC. The application of rHu-EPO can help improve the immune function in uremic patients.

Effect of epimedium sagittatum on IL-2 gene expression in 7/8 nephrectomized rats. *Chen Xiangmei, Liao Hongjun and Li Ninghong, Department of Nephrology, General Hospital of PLA, Beijing, China.* Chronic renal failure patients presented as immunodeficiency state. 7/8 nephrectomized rats were treated with traditional Chinese medicine *Epimedium Sagittatum* (EP) in form of decoction per os (6g/kg/d). The rats were killed after 3 months. The activity of IL-2 production from cultured spleen cells induced by PHA is higher in the group treated with EP than that of controls (19.4±2.6 vs 14.2±1.3 U/ml, $P<0.01$). IL-2 mRNA signal in Northern hybridization was determined by computer densitometry analysis. IL-2 mRNA expression was stronger in the treated group than controls (164±6 vs 16 320±5 660μm^2, $P<0.05$). The hemoglobin and renal function were measured in animal model (Table). It was concluded that Chinese berb EP could improve cellular immunity and renal function with the glomerular sclerosis decrease in chronic renal failure.

Group	N	Hb(g/l)	BUN(mmol/l)	SCr(μmol/l)
		Mean±SD	Mean±SD	Mean±SD
Normal	10	169±14	7.5±1.3	46.6±15.3
CRF	8	153±5+	20.8±6.6+	127.4±59.8+
CRF+EP	8	168±14*	15.4±2.0*	89.4±15.8*

+ $P<0.01$ vs normal; * $P<0.05$ vs CRF

Changes of insulin releasing response in chronic renal failure and the influence of hemodialysis. *Sun Weiming, Liu Bicheng, Yin Dongping, Renal Division, Affiliated Hospital of Nanjing Railway Medical College, Nanjing 210009, China.* Several studies have shown that perturbant glucose metabolism existed in patients with chronic renal failure (CRF). Owing to the recognition of the significance of hyperinsulinemia involved in the pathogenesis of hypertension, atherosclerosis and hyperlipidemia, it is important to clarify whether there is a disturbant insulin metabolism in patients with CRF. This study was to investigate the changes of glucose tolerance and insulin releasing response in 52 patients with different phases of CRF which induced by various chronic renal diseases excluding diabetic nephropathy. The experiment included 4 groups; Group A, included 12 patients whose renal function had reached azotemia (GFR 38.0± 12.1 ml/min); Group B, 12 uremic patients with GFR 8.4±4.1 ml/min. Group C, 18 maintenant hemodialysis patients; and group D 10 patients with normal renal function (GFR 97.8± 23.3ml/min). There was no significant difference in the ages among the 4 groups ($P>0.05$). The results showed that with declining renal function, the incidence of abnormal glucose intolerance and the incidence of abnormal insulin releasing response in group A (33%, 66%) and group B (55%, 83%) were significantly higher compared with group D ($P<0.01$). It was noted that the insulin releasing index (IRT), an index reflecting the ratio of blood insulin and glucose, was markedly high after the patients received conventional hemodialysis ($P<0.001$ vs predialysis).

Our preliminary observation suggested that marked glucose and insulin metabolism abnormality occurred in patients with CRF. Furthermore, with the increase of renal injury severity, the incidence became high. Conventional hemodialysis did not effectively clear up the media molecule — insulin from the body and which we speculated, might be associated with the hypoglycemia and hypertension presented in some hemodialysis patients.

Clinical effects of Rheum and Captopril in preventing progression of chronic renal failure. *Yu Yusheng and Li Leishi et al, Institute of Nephrology, Jinling Hospital, Nanjing, China.* A clinical trial was conducted to evaluate the effects of a Chinese herbal medicine, *Rheum E*, in the prevention of chronic renal failure (CRF). 150 cases with initial serum creatinine (SCr) level 274.6 ± 96.4μmol/L were allocated randomly into 3 groups; *Rheum E* treated group (6.2 ± 2.4g/d), captopril treated group (54±22mg/d) and *Rheum E* (6.2±2.1g/d) plus captopril (58 ±20mg/d) group. During the 15−62 months of treatment, all patients were kept on low-protein (0.6g/kg/d) and low-phosphorus (10mg/kg/d) diet. The results showed that the Scr level and blood urea nitrogen were stable or dropped slightly, while albumin rose during the follow-up period ($P<0.05$) in both *Rheum E* and *Rheum E* plus captopril groups. It also indicated that the progression rate of renal failure, calculated by regression of 1/scr vs time, retarded markedly in both *Rheum* plus captopril and Rheum groups as compared to the control captopril group. Uremic symptoms of nausea, anorexia improved in most of the treated patients. It is concluded that long-term low-dose *Rheum E* taken orally is beneficial to CRF. Its effect is better than that of captopril. The regime of *Rheum E* and captopril is a preferable choice in the long-term treatment of CRF.

Secondary hyperparathyroidism (SHP) in chronic renal failure (CRF). *Zhu Jianmin, W. E. Huffer*, A. C. Alfrey* and Cheng Qindi, Department of Medicine, 2nd Affiliated Hospital, Xi'an Medical University, Xi'an, China. Department of Pathology and Medicine, University of Colorado Health Sciences Center, Denver, CO, U. S. A.* Bone biopsies and serum biochemical data were compared between 37 CRF cases with SHP and 27 cases without SHP. The histological feature of SHP was osteitis fibrosa. In comparison with the non-SHP group, osteoclast number, bone mineration rate and bone formation rate were significantly increased and mineralization lag time was remarkably decreased in the SHP group ($P<0.01$). The serum level of parathyroid hormone (PTH) and alkaline phosphatase (AKP) was obviously higher in the SHP group than those in non-SHP group ($P<0.01$). There was significantly positive correlation between serum PTH level and some histological parameters including osteoclast number ($r=0.623$, $P<0.01$) and bone formation rate ($r=0.5779$, $P<0.01$). In our SHP series, the serum PTH level was higher than normal value in 78% of cases and serum AKP was higher than normal value in 84% of cases. This is of clinical significance for diagnosis of SHP in the CRF patients. However, some patients still need bone biopsy to confirm diagnosis and to direct treatment.

Significance of ANCA in kidney disease: a study of clinical and histological feature. *Yang Qi, Yan Yan, Wang Jianguo, Zhouzhuliang, Department of Nephrology, 281 Hospital of Beidaihe, Hebei, China.* To identify the significance of ANCA

(detected by ELISA) in renal diseases, the clinical and histologic findings were reviewed in 52 cases of primary glomerulonephritis (PGN) and 5 (all female) of lupus glomerulonephritis (LGN). There were 9 cases (5 of PGN and 4 of LGN), and the percentage of ANCA positivity was 9% and 80% in the PGN and LGN, respectively. There was significant difference between ANCA positive patients and negative groups in sex (positive group: female 100%, negative group: female 45% in the PGN, whereas there was no difference in age, proteinuria and creatinine clearance. There were 2 cases of acute glomerulonephritis in 5 ANCA positive patients with PGN and 1 case each of mesangial proliferation, IgA nephropathy, focal segmental glomerulosclerosis. The 9 ANCA positive cases had different degrees of crescents and interstitial lymphocyte infiltration. The data indicated that the ANCA positivity may play an active role in the pathogenesis of human PGN.

The demonstration of the positive ANAC (autoantibodies to neutrophil cytoplasmic antigens) in patients with glomerulonephritis. *Guo Ruxuan, Du Xiantang, Zhao Manrui and Xu Yongxian, Dept of the Renal Diseases of the Second Affiliated Hospital, Henan Medical University, Zhengzhou, China.* The serum ANCA was assayed in 50 patients suffering from glomerulonephritis with indirect immune fluorescence technique. Twelve patients showed positive ANCA but all negative in the healthy control group. Among the positive ANCA cases, one had acute glomerulonephritis, 6 nephritic syndrome, 3 SLE and 2 chronic glomerulonephritis with uremia. In ANCA positive patients, 10 had oedema and massive proteinuria, the proteinuric volume being 3 — 27 g/day, 8 cases low uric osmetic pressure $<$ 400 mOsm/kg of water, 3 hypertension, 2 blood urea, and 5 high blood creatinine. All were improved with corticoids and traditional Chinese medicine except one with terminal renal failure who survived by dialysis. Retrospecting our clinical and laboratory data, and reviewing literatures, we presumed that ANCA could be detected either in patients with systemic vasculitis and non-idiopathic creascentic glomerulonephritis or other kinds of glomerulonephritis. Our clinical data showed that better therapeutic effect could be achieved in the ANCA positive patients. The ANCA might not be a serological index of poor prognosis.

Clinical and pathological studies of renal damage in polyarteritis nodosa (PAN). *Hu Weixin, Li Leishi and Chen Huiping, et al, Institute of Nephrology, Jinling Hospital, Nanjing, China.* Early diagnosis for the renal involvement in PAN was critical for its prognosis. To find early diagnostic clues, 18 PAN cases with renal dagmage were investigated in this study. 72% cases presented with renal manifestations (nephritic syndrome, hematuria) at the onset. Clinical characteristics were as follows: hypertension (77.8%), severe anemia (94.4%), elevated SCr (mean 380μmol/L) and kidney enlargement (100%), nephrotic syndrome (55.6%). Extrarenal involvement: heart (55.6%), pericarditis (27.8%), gastrointestinal (38.9%), liver (33.8%), nervous system and joint (27.8%). Serum cryoglobulin was high (mean 99±94μg/ml), ANCA positivity by IF was 23.2%, whereas positive MPO-ANCA was 33.3%. In renal biopsies, fibrinoid necrosis in glomeruli and interstitial vasculi were found in 78% and 80.9%, respectively, crescent formation in 72.2% kidneys. Severe tubulor-interstitial lesions (acute and chronic) were present in almost all the patients. In conclusion, patients with renal menifestations, expecially with progressive deterioration of renal function, coexisted with hypertention, severe anemia and other organ damage should be highly suspected as PAN. Renal biopsy was critical for the early diagnosis and negative ANCA could not exclude PAN.

Treating infantile prupura glomerulonephritis with thymus immuno-suppressor essence. *Xue Aizhi, Yu Huafeng, Zhang Leling and Wang Shuying, Pediatric Hospital, Jinan 250022, China.* It was suggested that the pathogenesis mechanism of infantile purpura glomerulonephritis (IPGN) was associated with immune dysfunction: hyperfunction status in humoral immunity and hypofunction in cellular immunity. Clinically, there were no efficacious therapies.

In this study we reported the efficacy of PTISE (pig thymus immunosuppressor) in treating 31 cases of IPGN at a dose of 5mg/d, i.m. for 3 weeks, then 5mg twice weekly for 3—6 months. 24 cases of IPGN treated with conventional therapy served as controls. An observation period of 6 — 30 months showed that the effectiveness rate in the PTISE-treated group was 96.8%, while that in the control group was 87.5% ($P<$ 0.05). In both groups, immunoglobulin concentrations increased during the acute phase and then declined during the recovery phase. Cellular immunity was decreased in both groups during the acute phase with decrease of CD_3 and CD_8 in predominance. While CD_4/CD_8 ratio was increased. In the PTISE-treated group, CD_3, CD_4, CD_8 and CD_4/CD_8 ratio were increased and approached normal limits. In the control group, however, all above values were abnormal. There existed a significant difference between the 2 groups. The episodes of secondary infec-

tions and recurrences were more common in the control group than in the PTISE-treated group.

In conclusion, PTISE might be helpful in elevating immune functions, thus it was efficacious in treating IPGN.

Detection and clinical significance of antimyeloperosidase antibodies in patients with polyarteritis nodosa (PAN). *Zhang Shaoling and Li Leishi, Institute of Nephrology, Jinling Hospital, Nanjing, China.* Antimyeloperosidase (MPO) antibodies play an important role in the pathogenicity of polyarteritis nodosa. In this study the anti-MPO antibodies in 63 serum specimens were detected by specific ELISA and its clinical significiance analized. Anti-MPO antibodies were found positive in 6 out of 19 patients with PAN, while negative in 22 normal controls and 22 patients with other renal diseases. Among 6 MPO positive patients, 5 had pulmonary renal syndromes. In 1 patient undergoing repeated renal biopsy, MPO was assayed in various times. With the clinical remission, MPO antibodies disappeared. We conclude that the anti-MPO antibodies is a good marker of PAN, especially for the diagnosis of pulmonary-renal syndromes, and the anti-MPO antibodies may be associated with the disease activity.

The clinical significance of anti-neutrophil cytoplasmic antibodies in glomerulonephritis and vasculitis. *Yin Guang and Li Leishi, Institute of Nephrology, Jinling Hospital, Nanjing, China.* To evaluate the significance of anti-neutrophil cytoplasmic antibodies (ANCA) in glomerulonephritis and vasculitits, the patients with positive ANCA from 1280 serum samples between 1990 and 1993 in our institute were analysed. ANCA was detected by an indirect immunofluorescence method using ethanol-fixed neutrophils as antigen. 26 ANCA positive patients were found. All patients underwent renal biopsy. Among them, 4 had microscopic polyarteritis, 8 Henoch Schonlein purpura, 2 idiopathic pauci-immune crescentic glomerulonephritis, and 12 IgA nephropathy. Except one perinuclear ANCA (P-ANCA), all were cytoplasmic ANCA (C-ANCA). The ANCA positive patients had some common clinical (gross hematuria 62%, hypertension 31%, purpura 34%, bleeding of gastrointestinal tract and respiratory tract 14% and 12%, infection 80%, proteinuria <2.0g/24h 79%) and pathological features (necrosis of the capillary and small artery, proliferation of mesangial cell and endothelial cell). The data suggested that the pathogenesis of the diseases with positive ANCA might be somewhat similar, idiopathic pauci-immune crescentic glomerulonephritis and IgA nephropathy with ANCA positive may be classified as subtype of vasculitis.

Detection of anti-myeloperosidase antibodies by ELISA. *Zhang Shaoling and Li Leishi, Institute of Nephrology, Jinling Hospital, Nanjing, China.* A specific enzyme-linked immunosorbent assay for detection of anti-myeloperosidase (MPO) antibodies was established. Human MPO was obtained by Matheson's method, which included dialysis of a granule extract against low salt buffer, sephadex G-75 chromatography, and carboxymethylcellulose chromatography. Using established ELISA method, 6 out of 19 patients with PAN were found positive, while only 1 postiive by IIF. No positive was found in the normal control and patients with other renal diseases. The results suggested that ELISA was a sensitive, specific and reproducible method for detection of anti-myeloperosidase antibodies.

The Changes of renal interstitial lymphocyte subpopulation in patients with hemorrhagic fever. *Chen Huiping, Li Leishi and Zhou Hong, Institute of Nephrology, Jinling Hospital, Nanjing, China.* Except the direct injury effect of virus, the activation of immune system has been demonstrated to be involved in the renal lesions in the patients with hemorrhagic fever with renal syndrome (HRFS). In this study, we examined the changes of renal interstitial lymphocyte subpopulation and evaluated the role of lymphocyte in the renal injury. 33 cases were enrolled in this study, 30 males, 3 females, with an average age of 35.9 ± 4.2 years. All patients met with the diagnosis criteria of HFRS and had a sera titer more than $1:40$. Among them, 6 cases were mild, 16 moderate and the other 11 severe. The renal interstitial lymphocyte subpopulation were examined by 4 layer PAP method using specific antibodies against CD4 and CD8, respectively. The CD4/CD8 ratio (Rt) was calculated. Normal renal tissues from 10 donor kidneys for transplantation were used as control. The results showed: 1. The renal interstitial number of CD4, CD8 lymphocyte increased markedly, especially CD8. In most cases, the Rt was less than 1. The infiltrating CD4 and CD8 lymphocytes were mainly distributed in medullary tissues, especially in the interface of cortical and medullary tissue. 2. The rise of CD4 and CD8 was more obvious in the early stage of the disease than that in the later stage. 3. The infiltrating lymphocyte was found to be closely related to the acute lesions of kidney, including tubular and vascular degeneration as well as necrosis, interstitial edema, bleeding and so on, while not relat-

ed to the renal chronic histologic lesions, for example, tubular atrophy, thickening of basement membrane and interstitial fibrosis.

The study of renal function in kerein addict. *Liu Hui, Fan Jinming, Duan Yongshou, Huang Jie, Liu Yanmo and RuanJinhua, The First Affillated Hospital of Kunming Medical College, China.* We investigated the renal function of heroin addicts (n=28, 9F, 19M) and normal controls (n=20, 4F, 16M). The result is shown in the Table.

We found that episode of heroin addiction was positively correlated with β_2-microglobulin of serum and urine ($r=0.60$, 0.62, $P<0.01$), and negatively correlated with urine osmolulity ($r=-0.67$, $P<0.01$).

	Control	Heroin addict	P
Seru β_2-m (ng/ml)	2147.4±720.3	3162.3±576.3	<0.001
Urine β_2-m (ng/ml)	164.0±78.3	429.0±34.1	<0.001
Scr mmol/l	93.3±10.6	95.5±16.6	>0.05
BUN mmol/l	4.8±1.3	5.3±1.0	>0.05
Uosm m. Osm/kg	898.8±113.9	712.4±225.9	<0.001

Our study suggested that heroin could damage the function of glomerulus and renal tubules.

Lupus nephritis in adult males: analysis of the clinical and pathological featurer. *Wang Caili, Liu Yuchun and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* Systemic lupus erythematosus (SLE) is an uncommon disease in men with a sex ratio of 5-12 : 1 (F : M). In order to understand the clinical and pathologic characteristics of male LN, 50 male patients with LN and 50 age-matched female LN patients from 255 LN were analysed. Chi-square test was used for the statisitcs.

Result: 1. The age of the disease onset and diagnosis were older in male than female LN. The total male to female ratio was 1 : 4.5 in patients whose clinical manifestations appeared under age 40, and 1 : 2.8 in those with an older onset. 2. Urinary protein over 3.5g/24h and renal failure were more common in male LN than in female ($P<0.05$). In patients with serum creatinine from 186 to 442μmol/L, the ratio of the male to female was 2.45 : 1, whereas in patients with serum creatinine over 451μmol/L, the ratio was 7.59 : 1 ($P<0.05$). 3. The incidences of types IV and V LN were higher in male than in female, with a ratio of 1.14 : 1 and 1.74 : 1 respectively. Type II LN was found only in 7 female cases. In the same patholgic types, the incidences of hypertension, nephrotic syndrome and renal failure were also higher in male than in female, and relapses were much frequent in male. 4. The male to female ratio on recovery and improvement was 1 : 3.66 and 1 : 1.57, respectively. The mortality was higher in male than in female LN, the ratio being 2.9 : 1 ($P<0.05$). The male to female ratio 1-, 5-, and 10-year survival rate was 1 : 1.25, 1 : 1.68, and 1 : 1.51, respectively ($P>0.05$, $P<0.01$, $P<0.01$).

Conclusion: Male LN presents an older onset, more serious renal damage and worse prognosis.

Clinical and pathological comparison of lupus nephritis between males and females. *Hu Weixin, Li Leishi, Chen Huiping, et al, Institute of Nephrology, Jinling Hospital, Nanjing, China.* Lupus nephritis (LN) is not rare in male, about 10% as previously reported, but its characteristics and differences from females are still under investigation. In this study, 53 male LN (12.3% of all LN) were investigated and compared with 110 female LN. In two groups, the distribution of pathological types were similar (type I was not included). There were significant clinical, laboratory and pathological differences between male and female LN (Table).

	Male	Female
Symptoms at onset		
Renal[a]	45.2	14.5
Face rash[b]	28.3	47.2
Arthralgia[b]	18.9	43.6
Fever[b]	22.6	39.0
Renal insufficiency[a]	37.9	10.9
Pleuopericaditis[b]	50.9	31.8
Rash in trunk[a]	28.3	5.5
Raynaud's phenomenon[a]	7.5	40.0
Face fash[b]	56.6	73.6
RF positive[b]	11.3	54.5
Low serum C4[b]	75.5	25.0
Renal C4 deposit[a]	100.0	70.0

a: $P<0.01$, b: $P<0.05$

Other clinical and laboratory features were similar. In conclusion: male LN was less typical than females, renal involvement was more common and serious, extral renal involvement

was different from female patients. Complement C4 might play an important role in the pathogenesis of male LN.

Acute renal insufficiency in lupus nephritis: clinicopathologic analysis of 63 cases. *Liu Yuchun, Guo Zhiling, Jin Qizhuang, Zhang Youcai, Wang Caili, Pan Jisheng and Wang Haiyan, Institute of Nephrology Beijing Medical University, Beijing* 100034, *China.* Sixty-three cases of acute renal insufficiency (ARI) in 255 lupus nephritis (LN) patients hospitalized from 1980 to 1993 were analyzed clinicopathologically. The incidence of ARI was 24.7%. Serum creatinine (Scr) was >178.8 μmol/L in 47 patients (74.6%) and 442μmol/L in 16 (25.4%). The renal size was normal in 28 cases (44.4%) and large in 35 (55.6%). clinical and pathologic findings suggested an active course. Three to six months after aggresive prednisone and cyclophosphamid therapy, complete clinical remission was found in 51 (80.9%) out of 63 patients. Six of 9 cases stopped hemodialysis. The causes of death in 5 cases were cerenal lupus (4 cases) and heart failure (1 case). Conclusion: (1) ARI in LN is common (24.7%), especially in the active stage of the disease. (2) There is a good therapeutic response of active LN induced ARI to aggresive prednisone and cyclophosphamid therapy (80.9%).

The clinical and pathological aspects of membraneous lupus nephritis. *Yao Xiaodan, Li Leishi, Chen Huiping and Wang Qingwen, Institute of Nephrology, Jinling Hospital, Nanjing, China.* In this study, we retrospectively compared the clinical and pathological aspects of 44 SLE patients with membraneous lupus nephritis (V-LN) and 50 with diffuse proliferative lupus nephritis (IV-LN). All patients meet the diagnostic criteria of ARA (1982) for SLe. Based on the changes of the glomeruli, the 44 patients with V-LN were subdivided into pure V-LN group (n=18) and non pure V-LN (n=26), with the later having subendothelial immunodeposits or mesangial proliferation and/or capillary loop splitting. results are shown in the table below:

Items	V-LN	Pure V-LN	Non-Pure	IV-LN
Cases	44	18	26	50
Male:female	1:15	1:11	1:19	1:17
Age (yrs)	29.6±9.2	33.1±8.8	27.0±8.7	25.4±8.4
Cutaneous	32(72%)	10(55%)	22(84%)	44(88%)
Althragia	26(59%)	11(61%)	15(57%)	33(66%)
Ascitis	15(34%)	9(50%)	6(22%)	18(36%)
Cardiovascular	5(11%)	1(5%)	4(15%)	16(32%)*
Hb<90g/l	19(43%)	6(33%)	13(50%)**	33(66%)*
Nephrotic syn.	14(31%)	9(50%)	6(23%)	18(36%)
Scr>139μmol/L	3(6%)	0(0%)	3(11%)**	12(24*
ANA(+)	38(86%)	13(72%)	25(96%)	42(80%)
Anti-deDNA(+)	14(31%)	5(27%)	9(34%)**	36(72%)*
Anti-SM(+)	8(18%)	2(11%)	6(23%)**	15(30%)*
C3<60mg/dl	10(22%)	1(5%)	9(34%)**	35(70%)*
C4<40mg/dl	27(61%)	6(33%)	21(80%)**	36(72%)
Crescent	1(2%)	0	1(3%)	15(30%)*
T-1 infiltrates(>++)		0	19(72%)**	
T-1 Sclerosis(>+)			1(5%)	12(45%)**
Vasculitis		1(5%)	15(57%)**	

* $P<0.05$ between V-LN and IV-LN, ** $P<0.05$ between pure and non-pure V-Ln

Conclusion: V-LN is clinically different from diffuse proliferative LN in less frequency of arthral, cardiovascular, hematologic involvements, and less frequency of renal GFR compromise. V-LN itself is a heterogeneous group that at least can be divided into pure membraneous and non pure membraneous subgroups. Pure V-LN has less severe renal and extrarenal manifestations, no GFR decrease, and fewer changes of autoimmune parameters.

Neuropsychiatric disturbance in lupus nephritis: clinical analysis of 50 cases. *Liu Yuchun, Chen Wenhua, Jin Qizhuang Wang Caili, Pan Jisheng and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* The clinical features of 50 cases of neuropsychiatric disturbance (NPD) in 255 lupus nephritis (LN) were analysed retrospectively. There were 14 male (28%) and 36 female (72%) aged 15—57 years. The incidence of NPD in LN was 19.6%. 19 cases (38%) had neurological involvement, 15 cases (30%) psychiatric symptoms and 16 (32%) had a combination of neuropsychiatric manifestations. Neurological symptoms were epilepsy (48%), cerebral vascular accident (8%), cranial nerve injury (6%), headache, aseptic meningitis, intracranial hypertension. The psychiatric disturbance included depression, anxiety and psychosis. NPD was often associated with active feature of renal and somatic lupus involvement (56.5%). Those cases with NPD gave favourable response to intravenous high-dose methylprednisolone (MP) and cyclophosphamide (CPM) (58%), but still 8 cases (72.7%) could not be well controlled and died. Conclusions: (1) Neuropsychiatric involvement accuses in 1/5 of our LN cases. (2) The main manifestation of NPD is epilepsy but the presentation of most cases is various. (3) Though there is a good response to MP and CPM pulsed treatment, neuropsychiatric involvement is the main cause of the death (72.7%) in LN.

Clinical and pathological analysis of thrombolic microan-

giopathy in lupus nephritis. *Wang Huamin, Zou Wanzhong, Zhang Youkang and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* In order to observe the prevalence of thrombolic microangiopathy (TMA) in lupus nephritis and its relationship to clinical and pathological manifestations, 122 patients with lupus nephritis were analyzed. The prevalence of TMA was 36.8%. The incidence of leukocyte exudationin glomeruli, fibrinoid change, wire loops, cellular crescents, vasculitic damage, and diffuse interstitial inflamation of TMA group (N=45) was higher than that of the non-TMA group (N=77). The incidence of glomerular sclerosis, fibrous crescents, and tubular atrophy of TMA group was higher than that of non-TMA group. The ill duration of TMA was longer than that of the non-TMA (46.7±50.3 vs 15.1±19.1 months). The incidence of natural abortion, hypertension, edema, brain damage, anemia, leukocytopenia, and hypocomplementemia of TMA group was higher than that of non-TMA group. The 24h-urine protein amount and serum creatinine concentration in TMA group were more increased than that of the non-TMA group. The serum Alb concentration and Ccr of the TMA group were significantly lower than that of the non-TMA group. Our study shows that a high prevalence of TMA exists in lupus nephritis; which accompanied with many active pathological changes; the lupus nephritis patients with TMA in glomeruli are prone to hypertension; and the high risk factors of TMA are long course of illness, nephritic syndrome, and active lupus.

Alteration of tubulointerstitial volume in lupus nephritis. *Jiang Tang, Hu Yuanfang and Guan Weiming. Kidney Research Institute, the First Affiliated Hospital of Sun Yat-Sen University of Medical Sciences, Guangzhou, China.* Tubulointerstitial lesions is an important finding in lupus nephritis (LN). Sixty-eight patients with lupus nephritis were divided into 2 groups, one with (41 cases) and the other without (27 cases) apparent interstitial alterations. Quality and quantitative studies were carried out to observe the effect of the tubulointerstitial lesions, interstitial volume (IV) and glomerular lesions on the renal function.

The results showed that (1) The mean IV was 34.7±14.3% in the patients with apparent tubulointerstitial lesions, 15.1±6.2% in the group with no apparent tubulointerstitial lesions and 14.8±4.8% in the control. The mean △IV was 19.9±0.9%; (2) The patients with lower IV value (<10%) revealed very poor renal function; (3) There was close correlation between △ IV and the severity of tubulointerstitial lesions and the renal function; (4) There was no correlation between the renal function and the type, severity and activity of glomerular lesions, and IgG depositing in tubular basement membrane. The quantitative analysis of tubulointerstitial alterations is a useful tool for the evaluation of its functional significance in lupus nephritis.

Significance of anti-endothelial cell antibody in serum of patients with lupus nephritis. *Chen Xiangmei, Xu Qihe, Duan Yonggang and Chen Zhonghua, Department of Nephrology, General Hospital of PLA, Beijing* 100853, *China.* Antiglomerular endothelinal cell antibody in the serum of 22 patients (male 6, female 16, aged 27.8±7.5 years) with lupus nephritis (LN) was detected with ELISA. The relationship between antiglomerular endothelial cell antibody (AECA) and clininal, renal pathological data of the patients was studied. Results: (1) Serum AECA of 22 LN patients was 0.57±0.19, significantly higher than that of 12 healthy controls (0.38±0.085), $P<0.05$. We defined AECA higher than 0.47 as positive (+), and AECA hgiher than 0.55 as strong positive (++). (2) Urinary protein output and serum CH50 of the AECA(+) in LN patients were significantly lower than that of the AECA(−) LN patients (3.3±1.9g/24h, vs 5.8±3.9g/24h, $P<0.05$; 3800±4400U/L vs 15900±13400U/L, $P=0.027$), and the serum titer of ANA and anti-DNA antibody in AECA (+) patients were significantly higher than that of AECA(−) patients (1: 23.8±3.0 vs 1: 2.0±3.2, $P=0.003$; 0.4±0.21 vs 0.16±0.19, $P=0.038$). (2) Serum AECA was significantly correlated with C_3, $r=0.53$, $P<0.05$. (3) Reumatoid factor (RF) positive incidence in the AECA (++) patients was 5/6, significantly higher than in the AECA (−) and AECA (+) groups (1/16), $P<0.05$. (4) Renal pathological activity index of the LN patients was significantly correlated with serum AECA ($r=0.53$, $P<0.01$), but IgG, IgA, IgM, C_3, C_4, C_{1q} and fibrinogen related antigen deposition in the glomeruli were not different between AECA (+) and AECA (−) groups. Conclusions: 1. AECA was related to the clinical and pathological activity of lupus nephritis; 2. Although AECA was not correlated with the extent of glomerular endothelial cell proliferation, it can not be excluded that anti-endothelial cell antibody could mediate nephritis by endothelium injury.

Efficacy and immunosuppressive mechanism of pulse therapy of methylprednisolone in diffuse proliferative lupus nephritis. *Li Xuewang, Yang Jun, Pu Yufen and Duan Lin, Renal Devision, Department of Medicine, Peking Union Medical Col-*

lege Hospital, Bejing 100730, *China.* Twelve patients (8 female and 4 male, mean age of 32.5 years) with type IV lupus nephritis (proved by percutaneous renal biopsy) who did not respond well to consecutive prednisone therapy received intermittent large dosage methylprednisolone (1g/d×3−5 days) pulse and maintained prednisone (1mg/kg/d) treatment. The routine urinalysis, 24 hour uriprotein, serum creatinine, C3, CH50, ANA and anti-dsDNA, circulate immune complexes (CIC), ANA and anti-DNA, soluble interleukin 2 receptor (sIL-2R), tumor necrosis factor-α (TNF α) and CD4/CD8 were tested before MP pulse therapy and 3, 7, 28 days after respectively.

The data are shown in the Table. Most of the laboratory parameters improved at the third day after pulse therapy, but Scr improved at the 7th day only. All these parameters remained in the normal range at the 28th day after pulse therapy if the treatment was effective. Proteinuria decreased in 9 of 12 patients, and renal function improved in 6 of 7 patients (including 2 who received hemodialysis for 2-4 weeks). The most frequent side effects were hypertention (9/12), azotemia exacerbation (8/12), hyperglycosemia (3/12), and upper gastrointerstinal bleeding (1/12).

Clinial and experimental results after pulse therapy of MP in 12 patients

	Before pulse therapy	Days after pulse therapy		
		3	7	28
Hypertestion (n)	7(58%)	8(66.7%)	6(50%)	3(25%)
Serume critinine	3.03±1.58	3.29±1.76*	2.24±1.31*	1.64±0.75***
24h proteinuria	5.11±2.38	4.35±2.80*	4.20±1.38*	0.98±0.66***
C3(mg/dl)	35.75±28.25	43.77±22.59*	45.42±117.40*	66.67±11.26***
CH50(U/ml)	40.33±13.79	51.38±15.49*	55.58±12.93*	78.92±23.80***
Anti-dsDNA(%)	25±18		14±9**	7±5***
CD4/CD8	1.16±0.19	0.82±0.12**	0.94±0.10**	0.98±0.12*
sIL-2R(U/ml)	136.67±64.32	109.73±36.30**	72.91±53.58**	121.56±48.46*
TNF(ng/ml)	12.18±3.63	3.50±1.24**	5.59±2.52*	8.21±1.49*
CIC(μg/ml)	4.29±1.76	2.49±0.52*	0.74±0.32**	0.68±0.32***

* $P>0.05$, ** $P<0.05$, *** $P<0.01$

In conclusion, the sIL-2R, TNF α, CD4/CD8 could be important parameters to indicate the curative effect of MP pulse therapy.

Treatment of SLE and LN with small dosage of cortisosteroid combined with methotrexate, azathiprine and CsA. *Zhang Jie, Qu Suilin, Xu Guoxhang, et al, The Division of Nephrology, First Clinical Teaching Hospital, West-China University of Medical Sciences, Chengdu, China.* A regimen treating SLE and LN with small dosage of cortisosteroid combined with methotrexate, azathioprine and CsA was recommended. Prednisone 20mg/d, CsA 4 mg/kg. D^{-1}, OS, 1, 3, 4, 6, 7 weekly MTX 10-15mg, Dexamethasone 10-30 mg iv once a week, at an interval of 2 weeks after a course of 4 weeks treatment, oral maintenance therapy with azathioprine (50 mg daily), folid acid (50 mg/D. OS) on 1, 3, 4, 6, 7 every week were used at a 2-week interval.

The result of treatment in 26 patients showed that average clinical remission time was 39.5±16.45 and 57±20.6 days, respectively in the new regimen treated group and the group only treated with cortisosteriod. The new regimen treated group had better curative effects and less side-effects than the control group.

Clinical evaluation on cyclosporin A in treatment of lupus nephritis *Yin Peida and Yang Youyan, Kidney Research Institute, Sun Yat-Sen University of Medical Sciences, Guangzhou, China.* We studied the effects and safety of cyclosporin A (CsA) in the treatment of lupus nephritis (LN). 30 cases of LN randomly assigned to group CsA and group CTX, group CsA was subdivided into group CsA-I and group CsA-II. Group CsA-I (CsA+P) was treated with CsA (5mg/kg/d) and prednisone (P) (0.5-1mg/kg/d), group CsA-II (CsA+P+CTX) was treated with CsA+P as group CsA-I, while tapering dose of CsA to 2-3mg/kg/d, CTX 15mg/kg was given intravenously once every 3 weeks, and then CsA was stopped but CTX+P continued. Group CTX (CTX+P): CTX 8mg/kg/d was given intravenously for 2 days every 2 weeks until its accumulating dose had reached 150 mg/kg, P was given at 1mg/kg/d. Results indicated that the improvement of ESR and proteiuria and the increase of serum albumin were observed in the group CsA, but not in the group CTX, at the early stage of the therapy. 5 of 7 cases in group CsA-I relapsed after stopping CsA, but CTX added to 8 cases of LN before withdrawl of CsA, could prevent

the relapse of LN. In conclusion, it was an effective and acceptable new regimen for the treatment of LN.

TCM-WM treatment of 23 patients with lupus nephritis. *Wang Yaping and Zhou Zhuliang, Department of Nephrology, 281 Hospital of Beidaihe, Hebei, China.* The 23 patients with lupus nephritis (LN) pathologically diagnosed according to the WHO classification in 1982 were treated by the combined traditional Chinese Medicine (TCM) and western medicine (WM). There were 2 males 21 females, aged 15-50 years, averaging 26.4 years. All the patients received repeated kidney biopsy before and after TCM-WM treatment. The chief therapy: (1) Metacortandrecin: 40-60 mg/d taken totally at one time in the morning. At the same time, add cytoxan 0.2g/day, the total amount of intravenous injection being 8-10g. (2) *Tripterygium wildfordii*: 0.25-0.3g/kg/day decocted in water and taken orally. (3) Treatment with traditional Chinese medicine. In the 23 cases, the clinical targets were improved to some extent by the therapy of TCM-WM. But the pathological damages of renal histology were not completely improved along with their targets. 10 of the cases showed no changes at all (43.47%), 5 of them were aggravated (21.74%). It was suggested that the improvement of clinical targets does not mean the improvement of renal and pathological histology. The importance of repeated kidney biopsy lies in finding out the pathological changes of renal tissues so as to provide us with reliable basis for further treatment. LN is the sign of SLE activity. Hormone and CTX were selected in the first place in the treatment of the disease, but they produced severe side-effects such as serious infection, damage of the heart and liver, etc. The curative effect was raised and without any side-effect in our combined treatment with differentiation of symptoms and signs of TCM.

Dection of human cytomegalovirus in lupus nephritis: correlation with the activation of renal lesion? *Zheng Feng, Li Leishi, Zhou Hong and Zhang Jinghong, Research Institute of Nephrology, Jinling Hospital, Nanjing, China.* Immunocompromised subjects, such as transplant recipient and lupus patients with long-term steroid administration, are at high risk of developing cytomegalovirus (CMV) infection. Although only a minority of patients with CMV infection will develop serious CMV related diseases, there are evidences that CMV infection may trigger local event that lead to the activation and progression of renal lesion. This prospective study, based on gene amplification by the polymerase chain reaction and protein demonstration by the immunohistochemical staining, was undertaken to determine the incidence of CMV genome in both urine and kidney, as well as of CMV protein in kidney from 12 patients with lupus nephritis. Clinical data of the investigated patients are given in the Table.

Lupus nephritis	Cases	Sex(M/F)	Age	Scr(μmol/L)	Proteinuria(g/d)	Hematuria
Type IV, active	6	1/5	23—37	97—203 (2 elevated)	3.5±1.9	5 (cases)
Type II, inactive	6	1/5	13—39	51—87	2.5±1.5 (2 normal)	3 (cases)

We found urinary CMV(+) in 3 of 6 active cases, but all negative in 6 patients with inactive lupus nephritis. Similar results were obtained in kidney. The results provided evidence of an association between the presence of CMV and active lupus nephritis. However, it has been indicated that, because of the high incidence of CMV infection in normal, we must be very cautious to interpret this correlation.

Glucocorticoid receptor in peripheral lymphocytes and response to perdison in patients with lupus nephritis. *Yang Xiuchuan and Wang Haoran, Dept of Nephrology, Sichuan Provincial Hospital, Chengdu, China.* The GCR level in human peripheral lymphocytes was measured by whole cell binding assay using [^{3}H]-dexamethasone as a ligand in patients with LN. Control group, 30 cases (male 4, female 26, age 31.3±6.7). LN group, classified by ARA, 1988) 29 cases (male 2, female 27, age 36.8±7.9 years). Among them, 18 cases were in relapse, and 11 in remission. 11/18 cases were treated by GC (1.5mg/kg of predisone) for 3 months, and 7/11 cases were improved and 4/11 showed no significant effect by GC administration. The GCR level of 18 cases in relapse were 1589.4 sites/cell (SD=658.72), 11 cases in relapse were 2372.5 sites/cell (SD=892.4), the former was obviously higher than latter ($P<0.01$), and there was no significant difference between the latter and the control group (2448.1 sites/cell, SD=872.5). The GCR number of 4/11 patients in remission who showed no improvement by GC (645.3 sites/cell, SD=154.2) was lower than that of 7/11 cases who were improved (2087.5 sites/cell, SD=318.7) after GC therapy ($P<0.01$). This study showed that level of GCR in peripheral lymphocytes is well correlated with both patients in relapse and those in remission. The 7 of 11 patients treated with

GC who responded to GC have higher GCR number than those without response to GC. The result strongly suggests that the GCR in patients with LN is positively correlated with the response to GC. Patients with a high GCR number responded well to GC. So, the GCR number in peripheral lymphocytes may be one of important indications for predicting response to GC and estimating the progression of disease.

The Serum erythropoiet level in patients with systemic lupus erythematosus (SLE). *Lu Fangping, Wang Guochun, Du Xuehai and Wu Donghai, China-Japan Friendship Hospital, Beijing, China.* We measured serum erythropoietin (EPO) level in patients with SLE by ELISA, TOYOBO Company, Japan). All patients were diagnosed as having SLE according to the criteria by the American Rheumatism Association in 1982. The 36 patients consisted of 5 males and 31 females, with an average age of 33.1 years (range 19-56 years), average hemoglobin (Hb) of 10.4±2.3 g/dl. Three groups were divided according to the renal involvement: Group 1, no renal involvement; Group 2, with lupus nephritis (Ccr>40 ml/min); Group 3, with azotemia (Ccr <40 ml/min). 10 normal subjects served as control. Serum EPO levels ($\bar{X}\pm SE$, mu/ml) of 3 groups and control are shown in the Table.

	Control	Group 1	Group 2	Group 3
Number	10	10	16	10
EPO	6.58±2.73	14.02±7.10	9.94±5.14	7.46±3.40

$P<0.05$, as compared with control and group 3

The average EPO level of 36 paitents (10.387±5.799) was significantly higher than that of control ($P<0.05$). The serum EPO level was negatively correlated with Hb ($r=-0.50$, $P<0.01$). The average EPO level of 26 patients with renal involvement (8.986±4.644) was significantly lower than that of group 1 ($P<0.05$). A 35-year-old female patient, who had renal failure (BUN 92.9mg/dl, Cr 7.9 mg/dl), severe anemia (Hb 5.8 g/dl) and cirrhosis had the lowest serum EPO level (1.181 mu/ml). The above results showed that the serum EPO level of SLE patients is significantly higher than that of normal subjects. It may suggest that the kidney could produce EPO compensatively. With the reduced renal function, EPO level lowered, therefore leading to renal anemia. There was no correlation between the EPO level and the ANA titer ($P>0.05$), suggesting no relationship with the activity of the disease. Among 26 patients with renal involvement, 6 had high ALT level, their average EPO level was lower than that of the patients with normal ALT level. (7.337 mu/ml and 10.096 mu/ml, respectively), but there was no statistical significance.

HLA-DR gene frequency in patients with lupus nephritis. *Liu Shuwen, Chen Xiangmei, Bai Liqun and Gu Zhiyuan, Dept of Nephrology, Chinese Great Wall Hospital, Beijing* 100853, *China.* HLA-DR gene frequency was determined in 23 northern Chinese Han patients with lupus nephritis utilizing polymerase chain reaction and sequence-specific oligonucleotide (SSO) probes. The results were compared with the HLA-DR gene frequency of 255 healthy northern Chinese Han blood donors. Twenty-three patients were diagnosed as having lupus nephritis by renal biopsy. There were 8 males and 15 females, with an age range of 17-58 years averaging 28.7±18.4 years. 255 healthy blood donors were taken as controls. DNA was yielded using proteinase K digestion and phenol: chloroform (1 : 1) extraction. Polymerase chain reaction and a pair of primers P1 and P2 were used to amplify the specific DNA fragment. The amplifed DNA was dot-bloted onto nylon membrane and then hybridized with 30 SSO probes labelled with γ-^{32}P-ATP. The results showed that HLA-DR4 gene frequency increased (17.39 vs 9.0, $P>0.05$, RR=2.423) when compared with that of the controls. Meanwhile, HLA-DR1 gene frequency also showed an increase tendency (6.52 vs 1.96, $P>0.05$, RR=3.675). This study suggested that the pathogenic gene of northern Chinese Han patients with lupus nephritis may be closely related to HLA-DR4.

Significance of serum level of soluble tumor necrosis factor receptor (STNFR) and tumor necrosis factor α(TNFα) in patients with SLE and LN. *Tao Ye, Xu Guozhang, Liu Xianrong and Liu Xiaojing, Dept of Nephrology, West-China University of Medical Sciences, Chengdu, China.* TNFα plays an important role in the development of the disease. We applied competitive binding assay and cytotocity of L929 to study the level of STNFR and TNFα in 40 patients with SLE (20 in active and 20 in remission stage) and 20 normal subjects with matched age and sex.

The result showed that the levels of STNFR and TNFα (mean±SD) were significantly higher in SLE than in the controls (42.7±20.43 μ/ml v.s. 5.1±1.45 μ/ml and 14.51±9.06 μ/ml v.s. 5.93±1.66 μ/ml, ($P<0.05$). And the level of STNFR in patients with active SLE was higher than those in remission (48.72±26.7 μ/ml v.s. 36.13±19.35 μ/ml). But the TNFα level was lower in patients with active SLE. There was no significant correlation between the level of STNFR and TNFα in patients with SLE. After 3-month follow-up, 8 patients with ac-

tive SLE were greatly improved in both clinical and laboratory parameters, and the STNFR decreased simultaneously. There was close correlation between the STNFR level and the disease activity, also the ratio of STNFR/TNFα. Only 6 of 40 patients with SLE had clinical LN.

This study suggest that STNFR is an effective antagonist of TNFα, the level of STNFR and the ratio of STNFR/TNFα are useful markers in evaluating the SLE activity and the therapeutic effect.

Increased urinary complement inhibitory activity in lupus nephritis. *Yao Jian and Li Leishi, Institute of Nephrology, Jinling Hospital, Nanjing, China.* Complement activation and its activities are controlled by a variety of fluid and cell membrane-associated inhibitors. Many reports have suggested the presence of up-regulated expression of membrane-associated complement regulatory proteins in renal cells of several types of immune-mediated glomerulonephritis, including SLE in both human and animal models. To examine the activity of fluid phase complement inhibitors in diseased condition, urines from normal and SLE patients were analysed. Urine samples were collected from normal ($N=17$) and SLE ($N=19$) patients, thoroughly dialyzed against complement fixation diluent (CFD). The inhibition of the 50% lysis of sensitised sheep erythrocytes by dialysed urine was assayed. The results were expressed as percent inhibition of urine relative to the lysis in control CFD. The urines from both normal and SLE patients showed complement inhibitory effect to certain extent in a concentration dependent fashion. However, the urine specimen of active SLE patients expressed significantly higher complement inhibitory activity than silent SLE and the normal control (active SLE: $64.9\pm20\%$, silent SLE: $41\pm26\%$, normal control: $26\pm16\%$; active vs silent $P<0.05$, active vs control $P<0.001$, silent vs control $P>0.05$). Such activity was partially resistant to heat treatment (56℃, 30′) and not related to the amount of urinary red blood cells or protein concentrations. Conclusion: In accordance with increased expression of cell membrane associated complement regulatory proteins in renal tissue of SLE patients as previously suggested, there is also enhanced fluid phase (urine) complement inhibitory activity. Alterations of complement regulators may be of pathogenic importance in the disorders characterized by hypocomplementemia.

Clinical and pathological features of hepatitis B virus-associated atypical membranous glomerulopathy. *Chen Yipu, Cao Mingliang, Zou Wanzhong, Chen Guozhu and E Jie, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* Of the 1163 cases with glomerulonephritis with renal biopsies in our institute from April 1986 to March 1994, 60 were diagnosed as having atypical membranous glomerulopathy, including 34 with lupus nephritis (SLE-AMG) and 26 with hepatitis B virus-associated glomerulonephritis (HBV-AMG). No case with AMG belonged to primary glomerulonephritis. The percentages of cases with massive proteinuria, microscopic hematuria, low serum C3 level, renal insufficiency clinically, and with "full house" immune deposits, C1q deposits in glomeruli immunopathologically, were compared between SLE-AMG and HBV-AMG groups. Only the percentage of low serum C3 in SLE-AMG was higher than that in HBV-AMG ($P<0.05$). The above percentages were also compared between the groups of HBV-AMG and HBV-associated "typical" membranous glomerulopathy (HBV-MG, 24 cases). The percentages of hematuria, low serum C3, "full house" immune deposits with positive C1q deposits in the former were higher than those in the latter ($P<0.01$), but the rest were similar between the 2 groups ($P>0.05$). The results suggest that: 1) there might be some similarities in pathogenesis between HBV-AMG and SLE-AMG, e.g., multiple antigen-antibody systems are involved in these diseases and, therefore, deposit in different sites except subepithelial place in glomeruli, resulting in the "atypical" pathological characters of membranous glomerulopathy; 2) the pathogenesis of HBV-AMG, in some aspects, is probably different from that of HBV-MG, but the principal clinical and pathological appearances (proteinuria, hypertension, deterioration of renal function, and predominant change in glomerular basement membrane) are similar between them, so it is still reasonable to classify the HBV-AMG into the catagory of membranous glomerulopathy.

Hepatitis C Virus and Glomerulonephritis: A Screening of 736 cases. *Wang Haiyan, Yin Xiang, Liu Fanghua, Wang Li and Zou Wanzhong, Institute of Nephrology, Beijing Medical University and Department of Infectious Diseases, the First Hospital of Beijing Medical University, Beijing* 100034, *China.* Hepatitis C virus (HCV) an RNA virus first identified in 1989 has been reported to be associated with glomerular diseases. To evaluate the role of HCV infection in patients with glomerular diseases in China, we investigated 736 patients with glomerulonephritis and 100 normal volunteers. Antibody to HCV (HCV-Ab) was detected by ELISA (second generation) and HCV-RNA with the reverse transcriptase-polymerase chain reaction (RT-PCR). The presence of HCV-RNA by RT-PCR in frozen renal

biopsy specimens was also determined in the patients who had anti-HCV antibodies in the serum. In the normal controls, the prevalence of serum HCV-Ab was 2%. Among the patients with glomerulonephritis, 45 (6.1%) had HCV-Ab in their serum. Three of the patients were HBsAg positive. The HCV-Ab was increased in several types of glomerulonephritis, including minimal change disease (10%), mesangial proliferative nephritis (7%), membranous nephropathy (6%) and lupus nephritis (8%). However, an increased prevalence of HCV-Ab was only significant in focal segmental glomerulosclerosis (13.5%, $P<0.025$) and crescentic nephritis (15%, $P<0.01$). No association with membranoproliferative nephritis could be seen HCV-RNA was detected by PCR in 24 of the 42 patients with serum anti-HCV antibodies positive. Of 13 renal biopsy specimens, HCV-RNA was detected in 3, including one without HCV-RNA detected in the serum. Our data suggests an association of HCV infection with glomerular diseases, but it remains to be established whether this association is pathogenic or incidental.

HBV associated glomerulonephritis of adult and children. *Fang Lijun, Sheng Fangyun, Guo Yiqing, Wu Zhaolong, Hao Chuanming and Zhang Yue'e, Children's Hospital, Zhongshan Hospital, Huashan Hospital and Department of Pathology, Shanghai Medical University, Shanghai, China.* The clinical and laboratory surveys of HBV associated golomerulonephritis (HBV-GN) in 21 cases of adult and 22 cases of children from 3 hospitals of Shanghai Medical University were analyzed. The most frequent clinical menifestation was nephrotic syndrome, in children (20/22) and the nephrotic syndrome (11/21) and chronic glomerulonephritis (9/21) in adult. Pathologically, membranous nephritis was most common in both groups (17/22 in children, 10/21 in adult). The positive rate in HBV serological marker was higher in children (20/22) than in adult (11/21). Due to the variation of immunological state and fluctuation of HBV antigen titer in different patients, the repeated survey of HBV serological markers and immunochemical examination of renal tissue seem helpful for the diagnosis of HBV-GN. For treatment, 34 cases of nephrotic syndrome and chronic nephritis from the 2 groups were insensitive to glucorticord hormone. Four children were treated with rhIFNα_1. After follow-up for 0.5-1.5 years, the HBsAg and HBeAg in serum became negative and HBsAb turned positive in 2 cases; the proteinuria disappeared in the other 2.

Effect of advanced glycosylation end products on the renal function in rats. *Yang Junwei, Li Leishi and Yao Jian, Institute of Nephrology, Jinling Hospital, Najing, China.* Nitric Oxide (NO, an endothelium-derived relaxing factor) is an important mediator in the regulation of vascular tone. Advanced glycosylation end products (AGEs) have been implicated in many of the complications of diabetes and normal ageing. In this study, we evaluated the potential role of AGEs in endogenous NO metabolism, and examined its effect on renal function and blood pressure in rats. The intravenous AGEs infusion produced markedly increased mean blood pressure (MAP) in a dose-dependent manner, meanwhile, GFR and RBF were decreased as compared with control ($P<0.05$). The adminstration of L-arginine (60 μg/100g/h) alone did not modify any of hemodynamic parameters measured, but it effectively prevented all the hemodynamic and renal changes induced by the infusion of AGEs. The results suggested that AGEs may be an important modulator of NO synthesis, and affect the renal function and blood pressure.

Effect of Rhubarb on the glomerular morphologic changes in the streptozotocin-induced diabetic rats: a morphometric study. *Chen Huiping, Li Leishi and Yang Junwei, Institute of Nephrology, Jinling Hospital, Nanjing, China.* The Chinese traditional drug, Rhubarb, has been proved effective in the suppresion of the early stage renal hypertrophy in diabetic rats. In this study, the effect of diabetic rats were examined using an morphometric analizing system. The diabetic animal model was established by a single bolus of STZ and the rats were divided into 3 groups; group I, diabetic control rats; group II, Rhubarb treated diabetic rats; group III, normal control rats. The results showed: 1. The kidney weight increased in the STZ-induced diabetic rats as compared with normal control (group I vs group III, $P<0.01$), the hypertrophy was suppressed by Rhubarb (group II vs group I, $P<0.01$). However, there was no significant difference in body weight between Rhubarb-treated and untreated diabetic rats as observed at day 14. 2. 72 hr after the injection of STZ, the mean volume of glomeruli and capillary rose in diabetic rats, the increase was clearly inhibited by Rhubarb (group II vs group I; Glomeruli: 2.686 ± 0316 vs 3.444 ± 0.198, $\times10^6$, μm^3, $P<0.01$, capillary tuft: 2.817 ± 0.270 vs 2.863 ± 0.240, $\times10^6$, μm^3, $P<0.01$). 3. The area of mesangial matrix was also greater in diabetic rats than that in Rhubarb treated rats at day 3, 7 and 14 (group II vs group I; 0.169 ± 0.031 vs 0.261 ± 0.010, $\times10^3$, μm^2, $P<0.01$; 0.218 ± 0.007 vs 0.262 ± 0.044, $\times10^3$, μm^2, $P<0.001$; 0.235 ± 0.038 vs 0.495 ± 0.082, $\times10^3$, μm^2, $P<0.001$). Our study confirmed that Rhubarb could inhibit renal hypertrophy in experimental diabetic

rats.

High glucose media upregulate the anti-proliferative effect of transforming growth factor β on Mv1Lu and mesangial cells. *Yao Jian and Li Leishi, Institute of Nephrology, Jinling Hospital, Nanjing, China.* This study was designed to examine whether or not raising ambient glucose will modulate the cell responses to the biological effects of TGFβ. Except mesangial cells, Mv1Lu cell line was chosen because of its high sensitivity to TGFβ. The antiproliferative effect of TGFβ under various concentrations of glucose on cells was measured by ^{3}H-thymidine incorporation. The results showed that increased glucose levels inhibited Mv1Lu cell proliferation and meanwhile, significantly potentiated the anti-proliferative effect of TNFβ. Binding assay demonstrated the increased total binding of ^{125}I-TGFβ to mv1Lu cell precultured in high glucose media (5.5 mM 672±204; 25mM 960±421; 50mM 1063±203*, cpm, $P<0.05$), while no obvious change in non-specific binding (5.5mM 272±65; 25mM 217±64; 50mM 268±68). The similar results were observed in mesangial cells, but not so obvious as Mv1Lu cell line. We conclude that high glucose levels enhance Mv1Lu and mesangial cell response to the anti-proliferative effect of TGFβ by increasing specific binding of TGFβ to its receptor. The enhanced cell response to TGFβ in high glucose condition provides a novel mechanism for its action through which ambient glucose influences certain target cells.

Suppressive effect of Rhubarb on renal hypertrophy in STZ-induced diabetic rats and its possible mechanism. *Li Leishi, Yang Junwei, Liu Zhihong, et al, Institute of Nephrology, Jinling Hospital, Nanjing, China.* Our previous studies proved that Rhubarb (RO) could suppress renal hypertrophy in subtotally nephrectomized rats. This study was designed to examine the effect of RO on renal hypertrophy in diabetic rats and to explore its possible underling mechanisms. Diabetic rat model was established by a single i.v. injection of STZ (60mg/BW). Rats were divided into RO-treated, untreated group and normal control group. RO was given 8hrs after the induction of diabetes. The investigation was conducted at 1, 2, 3, 4, 7, and 14 day after STZ injection. The results: 1. The enlargement of kidney in RO treated group was significantly suppressed as compared with that in untreated diabetic rats as examined on day 3 to 14 after STZ injection (Kid wt 0.52±0.08 vs 0.68±0.10, $P<0.05$, at day 3; 0.64±0.11 vs 0.80±0.09, g, $P<0.01$, at day 14); 2. The morphologic study indicated the increment of mean glomerular volume (V_G), glomerular tuft volume (V_{tuft}) and mesangial area (A_{mes}) of the diabetic rats was obviously inhibited in RO treated group as observed on day 14 (V_G: 2.87±0.45 vs 3.24±0.35, $\times 10^6$, μm^3, $P<0.01$; 2.06±0.33 vs 3.27±0.64, $\times 10^6$ μm^3, $P<0.01$; A_{mes}. 0.24±0.04 vs 0.49±0.08, $\times 10^3$, μm^2, $P<0.001$). 3. Northern blotting analysis demonstrated that gene expression of TGFb, EGF, and PDGF-a as well as -b chain were upregulated in the glomeruli of untreated diabetic rats on day 2, while all these enhanced gene expression was suppressed in RO-treated rats. Conclusion: RO prevents the early renal hypertrophy of diabetic rats and counteracts the upregulated gene expression of a variety of cytokines in the glomeruli of diabetic rats. These effects might contribute to the therapeutic efficacy of RO in the treatment of diabetic nephropathy.

Prevention of renal hypertrophy, hyperfiltration and hypermetabolism in STZ-induced diabetic rats by Rhubarb. *Yang Junwei and Li Leishi, Institute of Nephrology, JinLing Hospital, Nanjing, China.* Our previous study has found that Rhubarb (RO) can slow the progression of CRF in diabetic rats. The present study was designed to investigate the effect of Rhubarb on early stage of STZ-induced diabetic rats. Animals were divided into diabetic group (n=18), RO treated group (n=18), and normal control (n=12). RO was given 8 hrs after initiation of experiment. Investigation was made at the 3rd and 14th day after bolus injection of STZ. Results: (1) Kidney weight increased significantly 3 days after STZ injection ($P<0.05$) with increment of glomerular content of protein and RNA. RO treatment prevented the renal hypertrophy (Kid. wt 0.52±0.17 vs 0.67±0.11 g, $P<0.05$) effectively. Protein and RNA content decreased by 23.3% and 17.1% respectively. (2) GFR of the diabetic rats increased by about 20% on the 3rd day of experiment ($P<0.001$ vs control). RO treatment did not change the situation at the early stage. But on the 14th day, the GFR of RO treated group was lower than the untreated rats (1.22±0.06 vs 1.58±0.12 ml/min/100g, $P<0.01$). (3) Isolated perfused rat kidney study showed enhancement of O_2 consumption (QO_2) on the 14th day of th experiment. RO treatment reduced the QO_2 and Basal QO_2 profoundly (79.8% and 73.2%) of the untreated). Conclusion: RO can suppress the renal growth, glomerular protein and RNA content, reduce O_2 consumption and GFR in the STZ-induced early diabetic rats. Its preventive action on the renal hyprtrophy, hyperfiltration and hypermetabolism might be of benefit for the treatment of diabetic kidney disease.

Evaluation of determination of urinary microproteins on diagnosis of early-stage diabetic nephropathy. *Zhang Qingyi, Ni Zhaohui, Lu Guanghua, et al, Department of Internal Medicine.*

Renji Hospital, Shanghai Second Medical University, Shanghai, China. Determination of urinary microproteins (including RBP, albumin, IgG, NAG) has been demonstrated valuable in this respect. This paper reports 101 diabetic outpatients with determination of urinary microprotiens (62 males and 39 females). They were divided into 2 groups, 1 with urinary protein negative and the other urinary protein > 30mg/dl. Group I had lower blood glucose levels and serum creatinines than group II. Group II diabetes were in the stage of overt nephropathy. Microproteinuria determinations demonstrated a significantly higher level in both groups than in normal controls. Analysis of various microproteins in group I found that 48.7% with urinary RBP, 59.2% with urinary microalbumin and 40.8% with urinary IgG surpassed the upper normal limit. If two or all three determinations were performed simultaneously, the positivity rate could be raised up to 75-80.3%. Urinary NAG activity of group I was 69.7% higher than normal upper limit, this can be also considered as an indicator of early diabetic nephrotic damage. Both NAG and RBP were positively correlated with blood glucose, total cholesterol, BUN and serum creatinine levels. In all, urinary microprotein determinations, better in combination, are useful indices for diagnosis of early diabetic nephropathy.

The production of transforming growth factor β in cultured mesangial cells and isolated glomeruli under high glucose condition. *Yao Jian and Li Leishi, Institute of Nephrology, Jinling Hospital, Nanjing, China.* Diabetic nephropathy is characterized by expansion of glomerular extracellular matrix. Although the mechanism (s) by which the process is initiated and propagated are still uncertain, transforming growth factor β (TGFβ), a prosclerotic cytokine has been suggested to play an important role. This study was designed to examine the secretion of TGFβ by both isolated glomeruli from diabetic rats and cultured mesangial cells under high glucose conditions. Wistar rats were made diabetic by a single injection of streptotozocin. TGFβ levels in the supernatants obtained from isolated glomeruli (5000/ml) 4wks after injection were determined by Mv1lu cell inhibition assay. The results showed that both total and active TGFβ secreted by glomeruli from diabetic rats were significantly increased as compared with control (experiment vs control, total: 719±8 vs 523 ±21 pg/ml; active: 203±29 vs 72.5±28 pg/ml, $P<0.01$). The increase of active TGFβ is more significant. Mesangial cells pre-cultured under high glucose conditions exhibited decreased expression of TGFβ mRNA as observed by dot hybridization, and decreased secretion of total TGFβ (5.5mM: 46.41 ± 2.5, 25mM: 19.25 ± 1.67, 50mM: 9.41 ± 0.68, fg/24h/cell), while production of active TGFβ increased slightly (5.5mM: 7.82±1.97, 25mM: 10.69±2.50, 50mM: 8.46±1.53 fg/24h/cell). These results suggest that abnormal production and activation of TGFβ may be involved in the development of mesangial expansion during diabetic nephropathy.

The alterations of tubular interstitium in noninsulin-dependent diabetic nephropathy. *Shen Keqin, Li Leishi, Yang Junwei and Zheng Feng, Institute of Nephrology, Jinling Hospital, Nanjing, China.* The changes of tubularinterstitium including tubular function, histology and urine EGF were assessed in 26 cases of noninsulin-dependent diabetic nephropathy (DN) and its role in the initiation and progression of DN was discussed. The results showed that 1. The losses of tubular function were not segmently distributed, covering both proximal and distal tubules. The histologic study demonstrated the presence of tubular atrophy, thickening of tubular basement membrane, interstitial expansion, as well as infiltrating inflamatory cells and various degree of fibrosis in the interstitium. 2. The alterations of tubular interstitium appeared before the obvious decline of GFR and aggravated with the deterioration of the renal function. This suggested that tubular-interstitium damage was also important in the process of DN. 3. The DN patients with less severe renal disfunction and slight tubular interstitium lesions had higher levels of urine EGF. The amount of urine EGF decreased with the deterioration of renal function and aggravation of interstitial fibrosclerosis. EGF may contribute to the damage of tubular interstitium.

Tissue-specific regulation of angiotensionogen (ANG) gene expression after renal ischemia in rat. *Guan Youfei, Gong Li, Zhang Zhiwen and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China (intr. by Dr. W. G. Couser).* The renin-angiotensin system plays an important role in several biological processes such as blood pressure regulation, sodium homeostasis, renal hemodynamic modulation and mitogenic action during acute renal ischemia. To elucidate the effect of renal ischemia on ANG gene expression in different tissues, male 2-mo-old Sprague-Dawley rats were subjected to 45 min of renal artery occlusion and reperfusion for 0-168h. Using Northern blot analysis, the amount of ANG mRNA was measured in liver, brain, aorta, adrenal gland, and kidney. After acute ischemia, the renal level of ANG mRNA decreased rapidly and progressively until undetectable after 12h of reperfusion, whereas the amount of ANG mRNA in liver, adrenal and aorta rapidly and significantly increased during renal reflow, with a

peak at 12-24h, and then decreased to below control levels after 72h of reperfusion. In contrast, no change was observed in the brain on the renal ischemic-reperfusion period. The results suggest that after acute ischemia, there is a down-regulation of ANG gene expression in the kidney, but the total body regulation of ANG gene expression (by liver, adrenal and aorta) is responsively increased. The brain autoregulates ANG independent of the body. We conclude that protective tissue-specific regulation of ANG gene expression does occur following renal ischemia.

Clinical analysis of 100 cases of acute renal failure in children: with 31 cases of pathological study. *Yu Li, Yang Jiyun, Bai Kemin and Liu Jingcheng, Department of Pediatrics, The First Teaching Hospital, Beijing Medical University, Beijing* 100034, *China.* One hundred cases of ARF admitted between Jan. 1981 and Dec. 1993 were studied. The causes of the 100 cases were: prerenal AFR 13% (acute GN 27, NS 11, RPGN 8, purpura nephritis 6, acute episode of CGN 6, lupus nephritis 5, hepatitis B virus associated nephritis 3, drug poisoning 6, renal malformation 5, hemolytic uremic syndrome 3, hemolytic anemia 2, renal tumor 2, Alport's syndrome 1, hepatorenal syndrome 1 case), postrenal 1% (renal lithiasis 1 case). The main clinical manifestations included: oliguria 68, anuria 12, edema 78, hypertension 61, gross hematuria 42, hemorrhage of digestive tract 21, hypertensive encephalopathy 11, congestive heart failure 18, pleural effusion 15 and pericardial effusion 13 cases. Pathological features of 9 kinds were found: (1) endocapillary proliferative GN 8, (2) MPGN 5, (3) proliferative sclerosing GN 5, (4) MsPGN 4, (5) FSGS 3, (6) crescentic GN 2, (7) acute interstitial nephritis 2, (8) glomerular minor lesion 1, and (9) lymphoma 1 case. 62 cases recovered completely, 25 improved, 5 died and 8 lost to follow-up. The RPGN and acute episode of chronic GN showed a worse prognosis.

Variation of intrarenal angiotensin II and angiotensin II receptors by acute renal ischemia in the aged rat. *Lü Xiaoyan, Li Xiaomei, Li Changling, Li Li and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* This study examined changes in systemic and intrarenal angiotensin II (AngII), AngII receptors in glomeruli and tubules and the expression of AngII receptor mRNA in the kidney following 45 minutes of acute renal ischemia in young and aged rats. Wistar rats were divided into 4 groups: young (G1 3—4 mons), aged (G2 23—24 mons) rats without ischemia; young (G3), aged (G4) with ischemia. There was no difference in circulatory or renal venous plasma AngII levels between G1 and G2. The dissociation constant (KD) of glomerular AngII receptors, however, was significantly higher in G1 than in G2 (17.4±2.5 vs 6.8 ±1.6 nM). Maximal binding (Bmax) was lower in G2 than in G1 (1315±48 vs 2035±257 fmol/mgp, $P<0.05$). No differences were detected in affinity or density for tubular AngII receptors between G1 and G2. The AT1 mRNA expression was much lower in G2 than in G1. After acute ischemia, AngII levels were significantly elevated in the renal vein, but not in the systemic circulation in both G3 and G4. The intrarenal AngII level was higher in G4 than in G3 (675±131 vs 508±103 pg/ml, $P<0.05$). Acute ischemia did not induce changes in the properties of AngII in the kidney of young rats. Interestingly, Bmax of glomerular AngII receptors was significantly increased in G4 (1852±94 vs 1315±48 fmol/mgp) while KD was unchanged. The expression of AT1 mRNA decreased in G3 and increased in G4. These results demonstrated that the AngII receptors and AT1 mRNA expressions decreased with the aging process in the rat glomerular and the whole kidney respectively, though there was no difference in plasma AngII level between the two age groups. The results also showed that acute renal ischemia affected the two groups with a pattern of great discrepancy in AngII receptor modulation, suggesting the effect of renin-angiotensin system on the susceptibility to acute renal failure in the aged.

Changes of epidermal growth factor during the convelescence from ischemic acute renal failure. *Huang Haichang and Zhang Minghe, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* Our research aimed to characterize endogenous EGF as a potential growth factor mediating the renal repair process, using Northern blot analysis of EGF mRNA with EGF cDNA probe, and immunochemical staining for EGF of the post ischemic rat kidneys. Rats were subjected to 45 minute occlusions of the left renal arteries, and contralateral nephrectomies were performed immediately after release of clamping, and the reperfused rat kidneys (n=5) were removed and studied at 1h, 2h, 6h, day 1, 2, 4, 5, 7 and 14 respectively. Our results showed: (1) The mean daily urine volume in rats significantly increased from day 1 to 5, and turned in day 6, 7 and 14, indicating a nonoliguric ischemic ARF model. Mean Bun and Scr concentrations increased and peaked at day 1 (n=5, $P<0.001$), then fell from day 2, and returned to normal at day 5. (2) The level of EGF mRNA rapidly decreased at 1h, and returned to normal by 2h, kept normal in 6h and day 1, then increased progressively from day 2 and peaked at day 5, and a progressive decrease in day 7 and day 14 were noted again. (3) Immunoreactive

EGF was distributed on the apical cell surface in cortex distal convoluted tubule and outer medullary thick ascending limb of Henle of normal rat kidney. In 1hr, 6hr and 1 day ischemic/reperfused kidneys, EGF disappeared in cell membrane, and reappeared at day 2, and the changes of immunostaining EGF corresponded to the changes of the EGF mRNA level. No positive staining EGF redistributed in the proximal convoluted tububle during the converlescence process. It is concluded that renal endogeneous EGF, markedly increased in the converlescence process, is strongly associated with the stimulation of tubular epithelial cell proliferation.

Effect of EGF in experimental toxic acute tubular necrosis (ATN). *Yu Yang, Zheng Falei, Bo Yuhong, Huang Qingyuan and Bi Zengqi, Dept of Nephrology, PUMC Hospital, Beijing* 100730, *China.* To test the effect of recombinant EGF on tubular regeneration in gentamicin (GM)-induced ATN, 3 groups of female Wistar rats were studied: I. Normal (NL, n=6); II. GM-treated (200mg/d×3 days, n=24); III. GM+EGF-treated (GM 200mg/d ×3 days, EGF 25μg, IP, n=23). Serum Cr (Scr) and renal H-thymidine incorporation (TDI), 6-keto-$PGF_{1\alpha}$ (PGF) and TXB_2 were measured at day 1, 4, 8, 12 and 15 after treatment. TDI in group III was markedly higher than in group II at day 1 (33±4.1 vs 15 ±4 cpm/μg DNA, $P<0.001$), 4 (447 ±40 vs 150±9, $P<0.001$) and 8 (168±16 vs 133±26, $P<0.05$). No difference in Scr between group II and III was found. PGE_2, PGF/TXB_2 ratio in group III was higher than in group II at day 4 and 8, and was related to TDI levels at the same day, respectively.

Conclusions: 1. Exogenous EGF may promote renal DNA synthesis and tubular repair in GM-induced ATN in rats, but may not get earlier recovery of renal function at the dose used in this study; 2. PGE_2 or PGF/TXB_2 is probably related to tubular DNA synthesis.

Effect of nitric oxide synthase inhibitor on angiotensinogen and kallikrein gene expression in rats. *Guan Youfei, Tan Dunyong, Gong Li, Tang Jian and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* (*intr. by Dr. W.G. Couser*). Nitric oxide (NO), the renin-angiotensin system (RAS) and the kallikrein-kinin system (KKS) have profound effects on renal hemodynamics, sodium transport and the medullary microcirculation. We used Northern blot hybridization technique to evaluate the effect of NO on angiotensinogen (ANG) and kallikrein gene expression in rat liver and kidney. Twenty minutes and 2 weeks after intravenous administration of L-NNA (N-nitro-L-arginine, 10 mg/kg), mean arterial pressure was significantly increased (132±5, 130±7 vs. 101±3, $P>0.01$). Compared with controls, the expression of ANG gene in the kidney was unchanged after 20 min of L-NNA injection and increased 1.5 fold after 2 weeks of treatment. In contrast, in liver and brain expression of the ANG gene was increased 4 fold at 20 min and returned to control levels at 2 weeks. Renal kallikrein gene expression was 2-fold lower than in controls after 20 min of L-NNA treatment, but returned to normal at the 2 week time point.

Our results showed that 1) NO inhibits hepatic and renal expression of the ANG gene at different time points; and 2) NO stimulates renal expression of the kallikrein gene. Our findings suggest that regulation of RAS, KKS and NO in kidney is complex and interrelated. Also upregulation of hepatic ANG mRNA levels by L-NNA may play an important role in the hypertensive effect of NO synthetase inhibitor.

Apoptosis in the repair process of damaged tubules from acute renal ischemia and reperfusion. *Huang Haichang, Wang Haiyan and Zou Wanzhong, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* Apoptosis or programmed cell death is one of the cell death forms for deletion of "unwanted" cells, and a mechanism for modulating cell proliferation and differentation. Different reperfused renal tissue from rats subject to left renal artery clamping for 45 minutes and simultaneous contralateral nephretomies were examined. Morphologic LM and EM showed that, 1h and 6h reperfused kidneys had no cell apoptosis, in 24h and 48h reperfused kidneys, proliferative and apoptotic cells were significantly increased, and decreased in 72h compared with control. Cellular DNA purified with phenol/chloroform from reperfused and control rat kidney cortex, were electrophoresis in a 2% agarose gel containing ethidium bromide, showing a "ladder" patten of DNA fragmentation in 24h and 48h reperfused rat kidneys. We suggest that epithelial cell apoptosis in the early repair process of damaged tubules may play an important regulating role in the renal tubular epithelial reconstruction and recovery.

The effect of sodium intake on post-ischemic kidney regeneration in rats. *Yang Jiajin and W. F. Finn, Department of Medicine, the University of North Carolina, Chapel Hill, NC, USA.* A curious relationship exits between sodium intake and the growth and development of the kidney. In rats, sodium supple-

mentation results in hyperplasia and an increased mitotic index in renal tubular epithelial cells. To determine the effect of dietary sodium on the recovery and regeneration of postischemic kidneys, kidney weight (KW), inulin clearance (Cin), renal DNA, RNA, protein content and ^{3}H-thymidine uptake were measured in 42 male Sprague-Dawley rats 2, 4, or 8 weeks after a 60-minute left renal artery occlusion. The right kidney was left in place. During this time, the rats were fed a low (0.03% sodium) or high (3.15% sodium) NaCl diet. Ten sham-operated rats fed a standard diet served as controls. In other experiment cell counts, ^{3}H-thymidine and ^{3}H-uridine uptake were measured in cultured LLC-PK1 cells to which the serum from postischemic rats fed low or high NaCl diet was added. The results showed that in rats fed a low salt diet KW and Cin of postischemic kidney markedly declined over 8 weeks. The RNA and protein content decreased over time and histologic evidence of tubular atrophy was observed. In rats fed a high salt diet, KW was less seriously reduced and Cin returned towards control values. The DNA content and ^{3}H-thymidine uptake rose to a greater extent and maintained at higher levels throughout an 8-week period and histologic evidence of tubular hyperplasia was demonstrated. The extent of recovery and regeneration of postischemic kidney was directly related to dietary sodium intake.

^{3}H-thymidine uptake in LLC-PK1 cells cultured at 72 hours in medium containing serum from rats with high salt was higher than that from rat with low salt ($P<0.05$). Serum from low salt rats failed to stimulate or possibly suppressed thymidine uptake in LLC-PK1 cells. The data indicate that after ischemic injury, sodium supplementation promotes tubular epithelial cell hyperplasia and sodium restriction induces tubular atrophy. A factor present in serum and modified by sodium intake may influence tubular epithelial cell growth and regeneration.

Morphological study on the role of AP and SOD in the injury of renal ischemia and reperfusion. *Wang Yongqing and Liao Lüxan, Department of Nephrology, Zhongshan Hospital, Shanghai Medical University, Shanghai, China.* SD male rats (weight 200—300g, n=56) were divided into 6 groups: 1. normal group; 2. sham-operated group; 3. ischemic group with right nephrectomy and occlusion of the left renal pedicle for 60 minutes; 4. reperfusion group, suffered from 60-min ischemia followed by 24h reperfusion; 5. Allopurinol (AP) group, AP was given to reperfusion group 5 minutes before occlusion of the left renal pedicle (40mg/kg body weight); 6. Superoxide dismutase (SOD) group, SOD was given to reperfusion group 5 minutes before occlusion and libration of left renal pedicle (8mg/kg body weight). The morphological changes of the kidney were studied with LM and EM. In group 2 no changes in glomeruli and renal tubules were observed. In group 3, renal medullary capillaries extravasted blood seriously. The size of renal tubular epithelial body and nuclei was enlarged as a result of edema. The vacuolar degeneration occurred in renal tubullar cells. Some of tubular brush border were damaged. Necrosis appeared in a few renal epithelial cells. In group 4, all injury above became serious. In group 2, no evident changes were found under EM in renal tubules, glomeruli and cell organs. In group 4, although glomeruli were almost normal, the edema and disfigurement occurred in the mitochondria of renal tubular cells. The number of mitochondria cristae decreased which were arranged in disorder. Many mitochondria (MIT) became obscure but only a few bursted. The density of mitochondrial matrix became unhomogeneous. Many ribosomes were detached from rouph endoplasmic reticulum, and pyknnosis took place in cell nuclei. Local necrosis occurred in cytoplasm. In groups 5 and 6, all above pathological changes were relieved remarkably. Most of mitochondrial cristae became clear, the number increased evidently, the arrangement in order, and the mitochondrial matrix density became homogeneous. These results suggested that free radicals may be related to the injury of renal ischemia and reperfusion. AP and SOD may relieve the renal injury of IARF. The injury of cell membrane and MIT may be an important factor in IARF pathogenesis.

Protective effect of Gypenoside in rat ischemic kidney, *Zhang Ping, Wang Xiaoyun, Department of Nephrology, The First Affiliated Hospital, Nanjing Medical University, Nanjing, China.* Gypenosides (GPS) is an extract of the herb, *Gynostemma Pentaphyllum Makino*. By clipping two-side renal artery of S.D. rats (60min), a rapidly decrease of RPF, GFR, urine Na^+(UNa), urine K^+(UK) and urine volume (UV) was induced till zero. In the reperfusion period, the recovery of renal function was very slow. After 3h washout, it still remained unchanged, GFR and RPF were 24.98% and 11.53% of the baseline (0.311±0.119 vs 1.245±0.288ml/min • 100g, 0.614±0.020 vs 5.324±0.624ml/min • 100g, $P<0.001$). However, these recovered respectively to 69.15% and 66.9% (0.845±0.161 vs 1.222±0.315, 3.358±1.396 vs 5.017±1.152 ml/min • 100g) after 3h washout when pretreated with GPS (3ml/100g i.v., $P<0.01$ compared with control group). UV recovered to baseline only after 1h washout (0.020±0.013 vs 0.018±0.017ml/min, $P>0.05$). UNa and UK also recovered more faster. This indicated that GPS have some protective effect in the hemodynamic changes of rat ischemic kidney, and promoted the

recovery of GFR, RPF, UNa, UK, and UV.

Effect of L-ARG on renal function in acute renal ischemia reperfusion injury. *Chen Ang, Lü Xiaoyan and Wang Haiyan, Institute of Nephrology, Beijing Medical University, Beijing* 100034, *China.* The effect of L-Arg on renal function and constitutive nitric oxide synthase (cNOS) mRNA expression were tested in both young and aged rats which underwent 45-min ischemia followed by 240-min reperfusion. GFR and RPF were markedly increased in aged rats receiving L-Arg (20mg/kg/h). Whereas dramatic decrease of GFR and RPF was seen in young rats receiving the same dose of L-Arg. Simultaneous infusion of L-NNA partially reversed the effect of L-Arg. Plasma cGMP level was increased in the aged rats. Urine cGMP was increased in the young, but there was no change of plasma cGMP. RT-PCR and Nortern blot showed that ischemia reperfusion decreased cNOS mRNA level in both young and aged rats. L-Arg, L-NNA infusion did not influence cNOS mRNA expression. No age dependent difference was seen. Nitric oxide (NO) was involved in acute renal ischemia reperfusion injury. There may be probable defect in self-regulation of NO production in the aged, so L-Arg exerted a protected effect in renal function of the aged. L-Arg affected renal function of the young in a different way. The substrate of cNOS may interfere with its own proper processing of NO. The changes of cNOS mRNA were retarded in the course. The possibility that inducible NO synthase participated in acute ischemia reperfusion injury remained to be elucidated.

Subacute iron loading enhances susceptibility to renal ischemia in rats. *Wu Zhaolong and Mark S. Paller, Shanghai Medical University, University of Minnesota, Minneapolis, MN* 55455, *USA.* Because chronic iron overload can cause organ injury in hemo-chromatosis and iron participates in injury during renal ischemia-reperfusion, the effect of mild subacute renal iron loading on the susceptibility to ischemic acute renal failure was evaluated. Male Sprague-Dawley rats were injected with iron nitrilotriacetate (Fe-NTA) (1mg iron/kg boby wt i. p. daily) for 5 days. Controls were injected with nitrilotriacetate (NTA). 72 hours later, the rats were subjected to 40-min renal artery ischemia. Iron loading increased by 28%. In kidney iron content, without any change in baseline renal function (plasma creatinine) or histology. Ischemic renal injury was far more severe in iron-loaded rats. We found that subacute renal iron loading increased lipid pesoxidation product malondialdehyde (MDA) of renal cortex of Fe-NTA left kidney compared with vehicle (NTA) left kidney (0.859 vs. 0.555 10^{-9}m, $P<0.01$). The value of MDA/protein (10^{-9}M/mg) of renal cortex of Fe-NTA left kidney was significantly increased (0.329 vs. 0.154, $P<0.001$) compared with vehicle left renal cortex. Plasma creatinine 24 and 48 hours after ischemia was significantly higher (3.3 and 3.4 vs. 2.2 and 0.8 mg/dl) and GFR was significantly lower in iron-loaded rats (0.30 vs. 0.78 ml/min). In addition, iron-loaded rats showed a dramatically greater extent of damage histologically by a semi-quantitative scoring method.

Effect of CyA-incubated endothelial supernatant on vascular smooth muscle and glomerular mesangial cell. *Sun Jianhua, Hao Chuanming, Zhang Ming, Lin Shanyan and Cheng Wenying, Division of Nephrology, Huashan Hospital, Shanghai Med. Univ, Shanghai* 200040, *China.* CyA could injur the subcellular structure of endothelial cell and affect its function and change the content of vasoactive substances such as endothelin (ET). In high concentration, ET would cause renal hemodynamic changes similar to renal toxicity and hypertension induced by CyA. So CyA-induced renal toxicity and hypertension may be partly due to the increase of ET content stimulated by CyA. To prove this, we have done following experiments. ET 10^{-7}M/L, CyA 100μg/l and endothelial supernatant incubated by CyA 100μg/l were added separately to the cultured rat aorta smooth muscle cells and glomerular mesangial cells. The result showed: in ET groups, after 20-25 min, contraction of smooth muscle and mesangial cells could be seen under LM. At the same time $[Ca^{2+}]I$ was (nM) 1831.03±20.7, 1971.45±16.21, as compared with those of normal groups (110.13±7.56, 119.25±7.78, $P<0.01$). In CyA groups, no significant changes were seen and $[Ca^{2+}]I$ being 299.17±8.35, 254.28±8.35. In CyA-incubated endothelial supernatant groups, after 18−20 min, contraction were seen under LM, $[Ca^{2+}]I$ being (nM) 1456.5 ± 58.3 and 1591.47±64.2, v. s. control groups ($P<0.01$). 15−20 min later, all contracting cells began to dilate while $[Ca^{2+}]I$ was 186.08±8.26 and 190.95±19.18 in ET groups and 300.12±19.4 and 319.96±27.24 in supernatant groups. CyA could separate smooth muscle and mesangial cells and increase intracellular free Ca^{2+}. These effects showed time-dosage-dependency. After 30h of CyA 100μg/L action, overt morphological changes of smooth muscle and mesangial cells could be observed under LM, including cellular swelling and cytoplasma vacuolation. Based on these experiments, we believe: 1. CyA-induced renal toxicity and hypertension are caused mainly by CyA-induced ET increment. The surplus ET can act on smooth muscle and glomerular mesangial cells, causing the release of intracellular

Ca^{2+} and the contraction of these cells, and resulting in the alteration of renal blood flow and blood pressure; 2. CyA also has a direct cytotoxic effect on vascular smooth muscle and glomerular mesangial cells.

Cyclosporin A induced endothelial cell injury. *Sun Jianhua, Cheng Wenying, Zhou Jianghua and Lin Shanyan, Division of Nephrology, Huashan Hospital, Shanghai Med Univ, Shanghai* 200040, *China.* In this study, cultured endothelial cells of human vena umbilicalis were used and the effects of CyA at different dosage and in different effect time on endothelial structure and function were observed. The 2nd to 4th generation of cultured cells were used. CyA was added at following concentration separately: 0, 50μg/L, 100μg/L, 200μg/L, 400μg/L and 500μg/L. Cell separation was found to be an early symbol of cytotoxicity of CyA. This could occur after 5—6 h at the maximum dosage. After 24h the percentage of cell separation at different dosage was 1%, 5.2%, 29.8%, 41%, 45.8%, 71.7% and 87.8%. After 24 of CyA, cellular swelling, cytoplasma opacity and cytoplasma vacuolation could be seen under LM, while various degree of mitochondria and endoplasmic reticulum injury seen under EM. However after trypan blue staining, no cell was found dead. Using ^{3}H-TdR incorporation and radioautography, CyA could obviously inhibit the DNA replication of endothelial cell, the inhibition rate being 0, 6.7%, 32.5%, 56.5%, 68.3%, 80.1% and 92.3%. Flow cytometry showed that aneuploid cells increased apparently with the increase of CyA dosage. Another presentation of cytotoxicity of CyA was that it could raise the concentration of intracellular free Ca^{2+} ($[Ca^{2+}]I$). Using Fura-2AM fluorescene loading method, we observed that after administration of CyA, $[Ca^{2+}]I$ of endothelial cell increased and showed a significant time-dose-dependency. The measurement of endothelin (ET) by RIA showed that the contents of ET of cell supernatant of administration groups were significantly higher than that of control group. Through the researches above, we suggest: 1. CyA has direct cytotoxicity effect on endothelial cell, showing that it can raise cell separation, destroy subcellular structure, inhibit DNA replication and change intracellular Ca^{2+} balance. 2. It can stimulate the synthesis and excretion of endothelin. Thus, we infer that CyA-induced renal toxicity and hypertension may be a result of multiple factors including destruction of endothelial structure and function, inhibition of repairment of injury, alteration of content of ET produced by these cells, and so on.

Protective Effect of Huangqi and calcium antagonist on CyA-induced cytotoxicity. *Sun Jianhua, Lin Shanyan, Hao Chuanmin, Zhou Jianghua and Cheng Wenying, Division of Nephrology, Huashan Hospital, Shanghai Med. Univ, Shanghai* 200040, *China.* It has been thought in previous studies that intracellular Ca^{2+} imbalance, renin-angiotensin, prostaglandins, ect. play a role in vascular injury and Chinese herb Huangqi (Astragalus root) had fairly good effects in many vascular diseases. According to these, while adding CyA 0—500μg/l to cultured human vena umbilicalis endothelial cells, we add Ca^{2+} antagonist verapamil 100μg/L, ACEI captopril 150μg/L, cyclooxygenase inhibitor indomethacin 10^{-4}M/L, Huangqi 40μg/l and control medicine Chinese herb Chaihu (Bupleurum) 40μg/L to observe their effects on CyA toxicity. We found that 1. Within 24h CyA action at 100 μg/l, all above drugs had certain protective effects including lowering of cell separation rates to 19.6%, 24.84%, 24.88%, 24.43% and 29.57%. 2. They could alleviate cellular swelling and cytoplasma vacuolation of endothelial cells exposed to CyA. 3. They could also alleviate the inhibition of endothelial DNA replication induced by CyA to 21.2%, 21.4%, 20.7%, 18.7%, and 27.25%, ($P<0.05$) when comparing with that of CyAA 100μg/L alone (32.5%). Flow cytometry also showed obviously reduced aneuploid cells. 4. These drugs could lower the increased $[Ca^{2+}]I$ caused by CyA to 370.4±19.9, 380.1±9.7, 400.1±19.6, 282.6±11.4, and 484.3±15.1 respectively compared with that of CyA 100μg/L alone (505.9±31.7, $P<0.01$). 5. Verapamil and Huangqi could reduce the increased supernatant endothelin (ET) content caused by CyA to 461.2±54.27, 290.63±41.6 (pg/ml) as against CyA 100μg/l alone (720.5±149.3, $P<0.01$). However, when the dosage of CyA was >200μg/l and the time >24h, all the drugs above except Huangqi had lost their effects. Our study indicates that: 1. In early stage, CyA-induced vascular injury may be a result of cooperation of multiple factors including intracellular Ca^{2+}, reninangiotenasin, prostaglandins, ect. With the increase of the CyA dosage, the prolongation of action time and the aggrevation of vascular injury, the imbalance among various vasoactive substances becomes more serious and the protective effects of those drugs become weaker. 2. Chinese herb Huangqi displayss a unique protective effect against CyA-induced vascular injury.

Cyclosporine toxicity modified by Oxypurinol in cultured LLC-PK1, MDCK and EA cells. *Yang Jiajin and W. F. Finn, Department of Medicine, University of North Carolina, Chapel Hill, NC, USA.* Cyclosporine (CsA) therapy may be accompanied by nephrotoxicity. To determine if CsA had a direct toxic effect on cellular growth patterns and to study the mechanism of its toxicity, LLC-PK1, MDCK and EA cell lines were exposed to

CsA, 250 or 1000ng/ml for 24 or 72 hours, with or without the addition of the xanthine oxidase inhibitor Oxypurinol (Oxy). The rate of cell replication was assessed by cell counts and ^{3}H-thymidine incorporation. Cell death was determined by the measurement of LDH release. Cell morphology was observed by both phase contrast and electron microscopy. In these studies, CsA inhibited cell growth and accelerated cell death. The events occurred in a dose and time dependent manner. When EA, MDCK and LLC-PK1 cells incubated with CsA for 72 hours, cell counts were reduced to 57+5, 56+3 and 61+5, ^{3}H-thymidine incorporation to 25+8, 59+38 and 70+21 and cell lysis increased to 154+7, 168+4 and 135+7 percent of control values, respectively. With the addition of Oxy to the media, CsA toxicity was significantly reduced. With CsA and Oxy, the cell counts were reduced to 88+5 ($P<0.05$), 77+6 ($P<0.05$) and 82+3 ($P<0.05$), ^{3}H-thymidine incorporation decreased to 35+12, 75+10 and 81+12 and cell lysis was increased to 142+8 ($P<0.05$), 158+12 ($P<0.05$) and 112+9 ($P<0.05$) percent of control values, respectively. CsA induced morphological alterations in all cell lines. In EA cells, the most prominent change was the appearance of numerous giant cytoplasmic vacuoles and in LLC-PK1 cells, the most striking changes occurred in mitochondria which were swollen and void of normal cristae. The nature of the changes was influenced by the specific properties of individual cell lines. In the presence of Oxy, the morphological changes were much less evident. In conclusion, CsA is directly toxic to cultured cells and may have peroxidative properties which are in part responsible for its toxicity. Oxy may modify the toxic effects of CsA by reducing oxygen free radicals formed by the action of xanthine oxidase.

Protective effect of Mg^{2+} on renal function of isolated perfused rat kidney with cyclosporine A (CsA). *Yang Huang, Department of Nephrology, 85 Army Hospital, Shanghai, China.* The effect of Mg^{2+} on renal function induced by CsA was observed in the isolated perfused kidney of Sprague Dawley rats. It was found that the perfusion of CsA (50mg/L) could induce the renal vascular constriction, the decrease of renal plasma flow (RPF) and GFR ($P<0.05$) with an accumulation of Ca^{2+} and a loss of Mg^{2+} ($P<0.05$) in the kidney. The renal action of CsA was much more prominent when the concentration of Mg^{2+} in perfusion fluid was lowered from 1.2 mmol/L to 0.12 mmol/L (RPF and GFR dropped by 24.1%±6.3% and 25.6%±4.3% respectively, and in the kidney Mg^{2+} decreased by 20% whereas Ca^{2+} increased by 4%) while significantly blunted with the perfusion of Mg^{2+} at 4.8 mmol/L. The protective effect of Mg^{2+} on the renal function changes induced by CsA might be related with the amount of inhibition of Ca^{2+} influx into the renal cells. It is suggested that sufficient Mg^{2+} supplementation in practice may be of beneft to protecting the kidney against CsA associated nephrotoxicity.

Multiprotein-zine (MPZ) protects the kidney from gentamicin (GM) induced lesions in rats. *Lang Dongmei, Xu Gang, Li Pingjun, Pan Qinglian and Xu Zhen, Air Force Jinan Hospital, Shandong, China.* Reactive oxygen species have been confirmed to play an important role in the pathogenesis of Gm nephrotoxicity. The effect of MPZ, a new antioxidant, on Gm induced acute renal lesions in Wistar rats was studied. Serum superoxide dismutase (SOD), MDA, BUN and SCr were measured and the renal pathological study was performed. The results showed that MPZ feeding (0.5/d for 6 days) prior to the Gm injection (100mg.kg^{-1}/d) could ameliorate the acute tubular necrosis both clinically and histologically with evlevated serum SOD level and lowered MDA, BUN and SCr as compared with the control rats. The intervention of MPZ and Gm at the same time did not show any beneficial effects on the kidney. The protection of MPZ on the kidney from Gm induced lesions is obvously related to its antioxidant effects.

Extracellular matrix accumulation in gentamicin nephrotoxicity and the protective effect of Chinese herb ginsenoside. *Liu Jie, Du Xuehai, Wang Hui and Du Zhaopeng, Dept. of Nephrology, China-Japan Friendship Hospital, Beijing* 100029, *China.* The accumulation of excessive extracellular matrix (ECM) following tubular injury represents an imbalance between ECM production and degradation. We assessed localization of ECM in a model of gentamicin nephrotoxicity in rats by immunohistochemistry. Following the increment of Cr, increased accumulation of lamimin, fibronectin and collagen IV were detected within TEC and along TBM in gentamicin nephrotoxified rats at 8 days ($P<0.01$, compared with normal control). Chinese herb Ginsenoside could decrease the accumulation of ECM accompanying a decrement of Cr ($P<0.01$, compared with the model). Our results demonstrate that ECM participates in the renal pathologic alteration of gentamicin nephrotoxicity, and Ginsenoside may reduce the accumulation of ECM.

Experimental study of renal injury after TA/CCS. *Qian Ji-*

aqi, Zhang Weiming, Division of Nephrology, Renji Hospital, Shanghai Second Medical University, Shanghai, China. Traumatic asphyxia (TA) or Crushing chest syndrome (CCS) is caused by severe compression of chest or upper abdomen. The objective of this study was to determine the frequency and severity of renal injury after TA/CCS. We made a TA/CCS animal model using a crushing chest apparatus designed by our hospital. Seven dogs, with average weight of 11.3±2.7 kg, were under the pressure of 8 times that of their body weight for 6-10 minutes (average 7.7±1.4 minutes). Our study showed that if the animal escaped from death after TA/CCS, the kidney was still injured, manifested by various degree of glomerular capillary congestion and tubular necrosis. Unlike the Crushing syndrome, the renal injury in TA/CCS was much milder. The laboratory findings are shown in the Table.

	Pre-compression	Immediately after compression	24h after compression	48h after compression
BUN (mmol/L)	3.3±1.5	3.5±1.5	3.9±1.3	5.1±2.7
LPO (μm/ml)	15.26±3.30	12.38±1.07△	17.92±6.30	15.52±3.24
SOD (μ/ml)	234.9±74.0	168.9±56.4△	192.2±95.4	200.7±66.1
6-keto (pg/ml)	2483±650	3917±536△	1971±474	2341±636
TXB_2 (pg/ml)	8102±1267	7582±1135	10801±2420△	10561±3332
6-keto/TXB_2	0.3170±0.1154	0.4331±0.1098	01913.9±0.0674△	0.2480±0.1154

△: $P<0.05$, compared with pre-compression.

The result suggested that oxygen free radicals and imbalance of PGI_2-TXA_2 may play an important role in the pathogenesis of renal injury after TA/CCS.

Researches of the therapeutic effect of ANP and Dopamin (DA) on ARF. *Chen Xiaowen, Yang Huabin, Zhou Weizheng, Mai Weimin and Li Dadao, Affiliated Hospital, Guangdong Med College, Guangzhou, China.* 30 male rats were randomly divided into normal, ARF, ANP, ANP+DA and DA groups. ARF model was made by intraperitoneal injection of CP 10mg/kg. After the injection of CP, no significant changes were found in the body weight, mean arterial pressure (MAP), urine volume and urinary Na^+. However, the GFR was decreased significantly (2.90+0.15 vs 0.52+0.10 ml/min, $P<0.01$) and EVk was decreased by 74% (0.78+0.13 vs 2.92+0.29 Omol/min, $P<0.01$). FENa and FEK were increased by 86% and 50%. After ARF and anesthesia, the rats were given tracheal, femoral artery, femoral vein and bladder catheterization. One h later, ANP 0.3μg/kg/min, ANP +DA 5μg/kg/min and DA at the same dose were added separately into normal saline and then were transfused at a speed of 85μl/kg/min. The result indicated that: MAP in ANP group was decreased significantly (9.1+0.5 vs 12.5+0.2 kPa, $P<0.01$); in ANP+DA group, there was no obvious changes; in DA group, it was increased slightly, 14.1± 0.4kPa. GFR in ANP+DA was improved most significantly (1.21+0.08 vs 0.52+0.11 ml/min, $P<0.01$) and improved in ANP group (0.95+0.12 vs 0.52+0.11 ml/min, $P<0.01$) and DA group (0.71+0.10 vs 0.52+0.11 ml/min, $P<0.05$). The sequence of the increasing of urine volume, EVNa and FENa was ANP+DA group, ANP group and DA group. In conclusion, ANP can ameliorate the renal function in CP-ARF. But the decrease of MAP induced by ANP inhibited its therapeutic use. If DA was used together with ANP, it can enhance the improvement of renal function of ANP, meanwhile it can antagonize the decrease of MAP. This method needs further clinical studies.

Renal damage during acute radiation sickness: clinical Report of cases including 2 cases of autopsies. *Cui Ruolan and Yuan Weijie, Department of Nephrology, Changhai Hospital, Shanghai 200433, China.* Clinical data: 7 male patients were ill with external radiation, and their average age was 41 years. Dose of irradiation: 11-12 Gy in 2 cases, 4-5 Gy in Gy in 2 cases, and 2-2.5 Gy in 3 cases, respectively. The conditions of all patients met the diagnostic standard of acute radiation myelopathy. Extra-severity was observed in 2 cases, severity 2, moderate severity 3 cases. Volume of urine, urinary routine, BUN and Scr were normal at the first day of radiation. No sign of renal damage was observed in 5 moderately severe and severe cases in Scr, urinary mi-

croprotein, urinary osomotic pressure and urine enzyme and β_2-microglobulin of urine and blood during the process of ARS and in 3 years of follow-up. One of extra-severe cases presented eye-naked hemuresis at the 21st day, and ARDS at the 22nd day after radiation. There were oliguria and anuresis after hypotension at the 23rd day. Peritoneal dialysis was carried out at the 24th day. The patient died at the 25th day. The other extra-severe case died at the 90th day after radiation but he did not present obvious clinical manifestation of renal damage before his death.

Renal pathology by autopsy. Case 1. Hemonephrosis and hemorrhage in mucohemorrhage were present in both kidneys, and many focuses caused by fungus occurred in renal parenchyma. Some glomeruli were enlarged by passive congestion. Exudative change was recognizable capsular space and renal tubule appeared dropsy. Tubular lumens were filled with epithelial cells or protein casts. There were changes of hemorrhage and congestion in renal interstial tissue.

Case 2. The pathologic changes in glomeruli, tubules, and interstitium were the same as those in case 1 but stenosis of proximal tubule fibrosis and hyalinosis in a few of glomeruli were found. Anemic infarction caused by verrucous vegetation secondary to bacterial endocarditis was present in the kidney.

Investigation of 32 cases of kidney damage induced by acute organophosphorus pesticides poisoning. *Zhang Su, Chang Jiashen and Zhang Zhenghua, Dept. of Internal Medicine, Hospital of Weishan County, Shangdong* 277600, *China.* 32 cases of kidney damage induced by acute organophosphorus pesticides poisoning were reported. There were 7 males and 25 females, aged 16-62 years (average 32.5 years). 31.4% (29/91) of the seriously poisoned patients had serious renal damage, 1% (3/303) of the moderately poisoned patients the moderate renal damage, but 598 of the slightly poisoned patients had no kidney damage. The differences in the 3 groups were significant ($P<0.01$). After comprehensive treatment, 21 were cured, their routine urine tests were normal 2-10 days after the treatment.

Eleven patients died, two of whom died of acute renal failure, and the other 9 of respiratory failure. The results showed that the kidney damage in most cases was not serious. The causes of the kidney damage may be as follows: organophosphosrus pesticides directly damaged the renal capillary, leading to the microcirculation occlusion, and accelerating the blood coagulation, and resulting in renal tubular necrosis. Ach greatly accumulated and reduced the effective circulating blood volume, and making juxtaglomerular cells screte a great quantity of renin, thus increasing the angiotensin-II which contracts the afferent glomerular arterioles, leading to tubular necrosis eventually. The poisons destroyed some enzymes of the renal cells.

Ultrastructure features in hemorrhagic fever with renal syndrome (HFRS). *Chen Huiping and Li Leishi, Institute of Nephrology, Jinling Hospital, Nanjing, China.* The renal ultrastructural changes of the patients with HFRS were analized by electromicroscopy. 33 cases were enrolled in this study, 30 males, 3 females, with an average age of 35.9±4.2 years, all patients met the diagnostic criteria of hemorrhagic fever and had a sera titer <1 : 40. Among them, 6 cases were mild, 16 moderate and the other 11 severe. According to the time of biopsy, the patients were divided into 3 groups, group I: biopsied within 2 weeks of the onset; group II: during 3-4 weeks of the diseases; group III: 1-2 months. The biopsy materials were sent for electromicroscopic studies. The renal ultrastructural changes of HRFS patients are summerized as follows. 1. The alterations of endothelial cells were most obvious, including the endothelial edema, degeneration and detachment from basement membrane; 2. The cells were rich in organelles, numerous lysosomes, dilatation of endoplasmic reticulum, megamitochondria were found in endothelial, epithelial and in tubular epithelial cells; 3. Basement membrane (glomeruli, tubuli and Bowman's capsule) thickening, segmental fusion of foot processes and collapsed tubular basement membranes encircling one or two degenerated tubular cells or cell debris were found in most cases; 4. In the early stage of the disease, the "tubular reflux" could be seen, tubular necrosis was more extensive than suggested by light microscopy. Besides single cell necrosis, tubular epithelial cells also had denudation of the TBM; 5. There was no Hantan virus in the renal tissues; and 6. Osmiophilic deposits were present in the TBM, GBM and Bowman's capsule.

Changes and clinical significance of serum sIL-2R level in patients with renal allograft. *Tian Jun, Lu Jianrao and Zhang Jinyuan, Department of Nephrology, First Air Force Hospital, Shanghai, China.* Soluble interleukin 2 receptor (sIL-2R) was measured by an enzyme-linked immunosorbent assay in 89 samples of plasma from 20 patients with renal allografts. Patients undergoing chronic dialysis had elevated sIL-2R levels (745.24±349.82μ/ml) which dropped after stable renal transplantation (411.67±284.21μ/ml). However, these values were higher than those of normal controls (247.35±66.52μ/ml). The marked increase in sIL-2R with rejection (1064.29±358.92μ/ml) was noted as compared with those in a stable allograft condi-

tion ($P<0.001$) and found 2-7 days earlier than the elevation of serum creatinine. There were significant differences between the sIL-2R level of patients with cyclosporing nephrotoxicity or acute tubular necrosis and acute rejection ($P<0.05$). The sIL-2R assay was considered as an important noninvasive test in the dignosis and differential dignosis of allograft rejection.

Effects low doses of dopamine and anisodamine on renal functions of early transplantation. *Lu Jianrao, Tian Jun and Zhang Jinyuan, Department of Nephrology, First Air Force Hospital, Shanghai, China.* It is known that dopamine reduces glomerular arteriolar resistance and improves renal cortical perfusion by interacting with specific dopaminergic receptors in the kidney. Anisodamine can intensify renal vasodilation of dopamine and counteract the increasing peripheral vascular resistance of dopamine. In order to study the effects of low-dose dopamine and anisodamine on rapid recovery of early transplanted renal function, 8 patients of the experimental group were observed and compared with 10 patients of the control group. Dopamine and anisodamine were administered intravenously after operation at 20mg, twice every day for 7 days in the experimental group. The results showed that the 24h urine output was more significantly increased and the recovery from raised creatinine was faster in the experimental group than in the control group from the second day after the operation. Serum creatinine was lowered to normal within 3 days on everage in the experimental group and 5 days in the control group. In conclusion, low-dose dopamine and anisodamine can facilitate rapid recovery of early transplanted renal function.

Analysis of death cause after kidney transplantation. *Xu Feifei, Division of Nephrology, First Affiliated Hospital, Wenzhou Medical School, China.* Of the 168 patients receiving kidney transplantation in our hospital from July 1985 through Dec 1993, 48 died (male 40, female 8, with a mean age of 40 years).

18 cases died of uremia after loss of graft function due to chronic rejection, 17 died of infection, 13 of whom had suffered from Grame negative bacilli neumonia, intestinal infection and wound infection; 3 fungus infection; and 1 case from neumocystis infection. Eight patients died of subacute hepatonecrosis due to drug toxicity, and all had chronic hepatitis type B, C or both during the pre-operative dialysis. Two men aged >50 years died of acute myocardial infarction. One case had acute rejection associated with rupture of the transplanted kidney, one had rupture of renal artery due to wound infection and one case died of esophageal cancer 4 months after kidney transplantation.

In conclusion: 1). The infection is still a top cause of death (37%) after kidney transplantation in our groups and most cases had had Grame negative bacilli infection. 2). The subacute hepatonecrosis due to drug toxicity in the patients associated with chronic liver damage during the hemodialysis is the second main cause of death and dialysis is the best choice of therapy for those patients.

Acute rejection after kidney transplantation: clinical analysis of 10 cases. *Yang Zhihao, Research Department of Organ Transplantation, China-Japan Friendship Hospital, Beijing 100029, China.* Clinical data of cases with acute rejection showed prominently macroscopic hematuria, which was directly caused by termination of Cyclosprin A (CsA) or sudden reduction of CsA dosage and a cold. This study showed that macroscopic hematuria of acute rejection is closely related with vascular rejection. The effect of steroid hormone ictus therapy was not significant, but that of intravenous CsA ictus therapy was fairly good. Thus, the therapy of CsA ictus should be used as early as possible for acute rejection with macroscopic hematuria. Acute rejection with macroscopic hematuria predicted that the rejection is serious, and the resistance to treatment and prognosis are poor.

Impact of acute rejection on chronic rejection in kidney transplantation. *Ji Shuming, Li Leishi and Chen Jinsong, et al, Institute of Nephrology, Jinling Hospital, Nanjing, China.* We assessed the impact of acute renal allograft rejection on the development of chronic rejection and subsequent graft loss. Forty-nine patients were divided into several groups for analysis according to the following criteria: 1. the presence or absence of acute rejection, 2. the onset time of acute rejection (early, <2 months post-transplantation vs late, >2 months post-transplantation), 3. the responsiveness during first acute rejection episode to steroid treatment. The rejection episode was diagnosed by percutaneous biopsy of allograft. The $CD4^+$ and $CD8^+$ cells in allograft were also examined. The results showed that the incidence of chronic rejection was 24.5% in those without acute rejection ($N=12$), while 33.3% in those with acute rejection <2 months ($N=21$, $P<0.01$ vs no acute rejection) and 56.3% in those with acute rejection >2 months ($N=16$, $P<0.01$ vs no acute rejection, $P<0.05$ vs early acute rejection). The recipients with repeated acute rejection had significantly more chronic rejection than those with only 1 rejection ($P<0.05$). $CD8^+$ cell in allograft increased persistently in recipients with chronic rejection.

The incidence of chronic rejection seemed not related to the responsiveness of patients to steroid treatment during first acute rejection episode. We concluded that time and frequency of acute rejection may be involved in the development of chronic rejection and subsequent graft loss.

The change of HLA-DR antigen expression in transplanted kidney and its significance. *Chen Huiping, Li Leishi and Zhou Hong et al, Institute of Nephrology, Jinling Hospital, Nanjing, China.* In this study, we examined the expression and distribution of HLA-DR antigen in transplanted kidney and evaluated the possible diagnostic value of HLA-DR expression in acute renal rejection. 40 patients who received allograft kidney transplantation were enrolled in this study (male 33 cases, female 7, with an average age of 38.8±7.7 years). All patients received routine combined treatment of cyclosporin, prednisone and azathioprine. The renal biopsy was conducted as a routine or at the time of showing sign of rejection after kidney transplantation. Renal HLA-DR antigen expression was stained by 4 layer PAP method using an moAB against HLA-DR. The results showed that there were both increased expression and altered distribution of HLA-DR antigen in transplanted kidney. The expression of HLA-DR antigen in 3 fashions: diffusely increased expression, locally increased expression and basically normal expression. There was also strong positively and weakly positive expression in the degree. A markedly increased and sustained expression of HLA-DR antigen was found in the patients with irreversible rejection and acute rejection, while expression in chronic rejection awaits further evaluation.

Clinical significance of PBMC of tumor necrosis factor α in acute kidney rejection. *Huang Qingyuan, Shen Lu, Li Xuewang, et al, Renal Division, Department of Medicine, Peking Union Medical College Hospital, Beijing* 100730, *China.* Tumor necrosis factor (TNF) is a macrophage-derived cytokine. It was reported to be an important marker in diagnosis of acute allograft rejection. In this study, the levels of tumor necrosis factor α (TNF) production in culture of peripheral blood mononuclear cells (PBMC) were measured in 15 patients with acute renal allograft rejection by ELISA. The results showed that the levels of TNFα in PBMC were significantly higher in the patients with acute rejection (568.7±305.3 ng/ml) than that in patients with a stable clinical course (7.0±4.1 ng/ml, N=9, $P<0.01$), in hemodialyzed patients (5.1±2.5 ng/ml, N=10, $P<0.01$) and in normal controls (4.3±2.8, N=14, $P<0.01$). The appearance of elevated TNFα was 3 days earlier than elevated Scr and BUN in acute renal allograft rejection. In conclusion, the levels of TNF produced by PBMC are probably useful parameters in the early diagnosis of acute allograft rejection.

Rapid diagnosis of cytomegalovirus infection after renal transplantation by antigenemia assay. *Xu Hongshi and Mei Changlin, Department of Nephrology, Changzheng Hospital, Shanghai, China.* Active cytomegalovirus (CMV) infection is an important cause of morbidity and mortality in recipients of renal transplantion, and graft rejection and loss. Early and rapid diagnosis and prompt therapy of such infections are imperative. In this study, we detected 44 renal transplanted recipients by antigenemia assay, and studied the relationship between antigenemia assay and CMV routine culture, CMV-ELISA and CMV-specific clinical menifestations. CMV antigens were detected in 26 of 44 patients, the CMV antigen positive rate in renal recipients being 59%. CMV-Ag^+ PMNs were found in 26 of 28 patients with active infection and in 1 of 16 patients without active infection, showing an overall sensitivity of 89% and a specificity of 94%. CMV antigenemia assay was obviously correlated with CMV routine culture and CMV-IgM, IgG detections ($P<0.005$). The number of infected PMNLs was related to the appearance of specific clinical symptoms. The results showed that antigenemia assay has more practical advantages than CMV routine culture and CMV-ELISA, which was rapid, simple, sensitive and specific, and could reflect the viral load in the systemic circulation. In conclusion, antigenemia assay is a method for the early diagnosis and monitoring of active CMV disease in recipients of renal transplantion.

Prolongation of cardiac allograft in rats treated with tripchlorolide. *Li Xuewang, Yang Jun, Bi Zengqi and Liu Tang, Renal Division, Department of Medicine, Peking Union Medical College Hospital, Beijing* 100730, *China.* A Chinese herbal medicine *Tryptergium Willfordii Hook* (TW) is an effective immunosuppressive medicine used in the treatment of SLE, glomerulonephritis, nephrotic syndrome, rhuematoid artheritis and so on. Tripchlorolide (T4), a new product purified from TW is an effective immuosuppressive drug. We compared the mean survival (MS) of the cardiac allograft in the Lou-to-F344 rats, the scores of pathologic damage of graft heart, the levels of serum

soluble interleukin-2 receptor (sIL-2R), and the production of interleukin-2 (IL-2) of splenocytes stimulated by Con-A in 3 groups of rats. Group A received no drug (N=8), Group B received T4 100μg/kg/day (N=9), and group C received cyclosporine 16 mg/kg/day (N=9). The results showed that 6 cases in group B and 7 in group C had the MS of cardiac allograft over 14 days. The Ms of group B and group C was significantly longer than group A (8.63±2.45 days). The mean histologic scores of rejected allograft heart in groups A, B and C were 3.63 ±0.52; 2.44±0.88 ($P<0.01$, compared with group A) and 1.88±0.93 ($P<0.01$) respectively. The sIL-2R levels in 2 weeks after transplantation in groups A, B and C were 780± 112, 284±82 ($P<0.01$, compared with group A) and 381±96 U/ml ($P<0.01$) respectively, and the IL-2 activity was 460± 44U, 68±21U ($P<0.01$) respectively, compared with group A) and 46±14U/ml ($P<0.001$), respectively.

In conclusion, T4 could prolong the survival and inhibit allograft rejection; and it had similar supressing effect on the generation of IL-2 and the expression of IL-2R to cyclosprine. We suggested that T4 might be a new anti-rejection medicine and can be used in organ transplantation.

CD4/CD4, SIL-2R, IL-2 and TNFα are indicators of acute renal allograft rejection; analysis of 21 cases. *Yang Jun, Li Xuewang, Zheng Falei and Bi Zengqi, Renal Division, Department of Medicine, Peking Union Medical College Hospital, Beijing* 100730, *China.* In order to confirm the effect of the serum immunological parameters on acute rejection diagnosis, we observed the changes of CD4/CD8, sIL-2R, IL-2 and TNFα in 21 kidney transplanted patients during the stable renal function, the episodes of acute rejection and after bolus mythlprediselone therapy. Seven females and 14 males, with a mean age of 35.4 years, had acute rejection recognised by clinical investigation, and 5 of them were proved by allograft renal biopsy. Serum creatinine, interleukin 2 generation, serum soluble interleukin-2 receptor and tumor necrosis factor α were tested in the steady phase of renal function without rejecton evidence. Cytokines of kinetic changes were investigated in all patients with bolus methylprednisolone therapy after 3, 7, 14, 28 days respectively.

The specificity and sensitivity of all the parameters for the rejection diagnosis are shown in the Table. Renal function improved in 18 of 21 patients with allograft rejection. Cytokine levels dropped in patients with good response to antirejection therapy.

	N	Steady phase	Acute rejection	Positive	Specificity(%)	Sensitivity(%)
CD4/CD8	21	0.88±0.12	1.12±0.20**	18△	88.89	85.71
sIL-2R(μ/ml)	20	89.73±26.35	332.24±107.24**	18△△	83.33	90
TNFα(ng/ml)	21	1.55±0.68	24.26±3.73**	16△△	81.25	76.19
CIC(μg/ml)	21	0.99±0.52	1.48±0.56*			
IL-2(μ/ml)	17	42.69±25.18	224.56±118.52**	12△△	75	70.58
CD4/CD8+sIL-2R				16	93.75	80
CD4/CD8+sIL-2R+IL-2+TNFα				10	100	58.82

* $P>0.05$; ** $P<0.01$; △ratio of CD4/CD8>1.1; △△ two times that of steady phase

In conclusion, the TNFα, IL-2 generation, sIL-2R and CD4/CD8 are useful parameters in the diagnosis of acute rejection of renal allograft. Combination of the 4 markers will increase the specificity (100%), but lower the sensitivity. The CD/CD8 associated with sIL-2R will be a best parameter to indicate the effects of MP therapy.

Tripchlorolide and cyclosporine A supressed the Gene expression of interleukin 2 and interleukin 2 receptor α mRNA by dot blotting in cardiac allograft rats. *Yang Jun, Li Xuewang, Bi Zengqi and Liu Tong, Renal Division, Department of Medicine, Peking Union Medical College Hospital, Beijing* 100730, *China.* Preliminary data indicated that cytokines mRNA activation occurred early after transplantation and progressed with allograft rejection. In another paper, we reported that tripchlorolide (T4) could inhibit allograft rejection, and suppress the generation of IL-2 and the IL-2R expession of transplant recipients in rats. In order to further assess the immunosuppressive mechanism of T4, we studied the gene expression of IL-2 and IL-2 α mRNA.

The cardiac allograft rats (Lou→F344) were divided into 3 groups; Group A received no immunosuppressive agents (N=8), Group B received T4 100μg/kg/d (N=9), and Group C cyclosporine A 16mg/kg/d (N=9). At the 15th day after transplantation, the IL-2 and IL-2R α mRNA transcription in the total RNA extracted from Con-A stimulated spleen cells were determined by dot blotting. The results showed that the density of dot

hybrizing messages (area) of IL-2 cDAN probe in the Groups A, B and C was 1.021±0.58, 0.219±0.141 ($P<0.01$, compared with Group A), 0.185±0.142 ($P<0.01$) respectively; and that of IL-2R α cDNA probe was 0.599±0.271, 0.178±0.128 ($P<0.05$, compared with Group A) and 0.225±0.164 ($P<0.05$) respectively. The intensity of hybrizing was correlated with the degree of histologic damages during allograft rejection in rats.

Our studies suggested that T4 had a strong suppressing effect on the gene expression of IL-2 and IL-2R α mRNA. It might be the molecular mechanism of T4 on antirejective effect.

Review and analysis of 113 cases of cadaveric renal transplantation. *Jiang Zongpei, Zhang Shiguang and Zheng Keli, et al, Department of Nephrology, the First Affiliated Hospital, Sun Yat-Sen University of Medical Sciences, Guangzhou, China.* There were 113 cases of cadaveric renal transplantation in our hospital within 6 years from May 1987 to August 1993. These patients are all Chinese and followed up in our hospital. The etiology of renal failure in order was glomerulonephritis, obstructive nephropathy, hypertensive nephropathy, and so on. Preoperative routine tests include barium meal, B type ultrasound, panel reactive antibody (PRA), and lymphocyte toxicity test. Patients whose PRA>10% or retransplanted, exchanges of plasma and exosomatic experimental renal transplantation were performed regularly, and OKT_3 or AALG/ATG used against graft rejection. Immunosuppression therapy included CsA, prednisone and Imuran. If patients with abnormal liver function or positive HBeAg. Imuran should be avoided. To deal with acute graft rejection, Methyprednisolone was used regularly. If the effect was not ideal, OKT_3 or ALG/ATG should be added. If hyperacute rejections occurred, exchange of plasma should be performed. Our data showed that patients' survival rate of 1, 3, 5 years were 92%, 85%, and 83%, graft survival rate of 1, 3, 5 years were 90%, 74%, and 46%, respectively. There were 16 deaths. The cause of death in order were rejection and infection, liver failure, cerebral vascular accident, and so on. Most infections occurred after rejection and using immunosuppression therapy. Pneumonia was most common. Pathogens were bacteria, CMV, TB, Pneumocystis carinii and L form of bacteria. So we conclude that reducing rejection and prevention of infection remains the key to increasing the survival rate of patient and graft.

In vitro IL-1 production by different dialysers and lipopolysaccharide. *Zhang Xun, Hou Fanfan, Liu Zhiqiang and Yang Tiecheng, Department of Nephrology, Nanfang Hospital, Guangzhou 510515, China.* This study investigates the IL-1 production in vitro by peripheral blood monocytes in patients with maintained hemodialysis (HD) following contact with different dialysers (cellulose acetate, polyacrylnitrite, polysulfone and hemophan) in the presence or absence of lipopolysaccharide (LPS 5μg/ml). The results showed that IL-1 production by HD patients' monocytes without contact with membrane and LPS was significantly higher than that by normal human monocytes (1678±167 vs 839±309 CPM, $P<0.01$). This indicated that the patients' monocytes became activated during long-term HD. When patients' monocytes contacted cellulose acetate, but not other membranes, IL-1 production further increased (3410±1082 vs 1678±167 CPM, $P<0.01$). LPS stimulated monocytes to produce a significant amount of IL-1 both from HD patients and normal controls (5902±872 and 3850±1016 CPM, respectively, $P<0.01$). Cellulose acetate and polyacrylnitrite plus LPS had a synergic effect on IL-1 production, the increament of IL-1 production induced by the two triggers was larger than that from each membrane and LPS.

Changes of lymphocyte secreting function in hemodialyzed (HD) patients. *Shi Yuexian, Hou Fanfan and Zhang Xun, Nanfang Hospital, Guangzhou, China.* Patients with long-term hemodialysis usually have lymphocyte function deficiency. β_2-microglobulin (β_2M) and immunoglobulin (Ig) are mainly secreted by lymphocyte. Our study evaluated the lymphocyte secreting function in HD patients. Three patients with uremia undergoing regular maintenance HD (average 2.2 years) and 3 healthy volunteers were studied. Peripheral blood mononuclear cells (PBMCs) were isolated from patients and controls. Cells were cultured with dialysers made from cuprophan, cellulose acetate, hemophan, polyacrylonitrile (PAN), polypropylen, polysulphone (PS) at 37℃ in 5% CO_2 incubator. PBMCs cultured separately were used as controls. β_2M and Ig (IgM, IgA, IgG) concentrations in the supernatants were measured after 72 hours of culture by radioimmunoassay and ELISA technique. β_2M concentrations from cultured lymplocytes in uremic patients were significantly higher than those in healthy controls (214.5±30.7 vs 160.4±12.4, $P<0.05$). When PBMCs from patients and healthy controls incubated with PAN or PS, β_2M concentrations decreased (127.3±21.2, 132.8±9.1 vs 160.4±12.4; 161.6±29.5, 169.5±8.3 vs 214.5±30.7, $P<0.05$). Incubation with PAN or PS containing a definite β_2M concentration showed that the decreased β_2M concentration was not caused by membrane absorp-

tion. IgG and IgA concentrations in uremic patients were significantly lower than those in healthy controls (251.8±9.5 vs 326.4±33.6; 38.7±17.2 vs 111.4±23.7, $P<0.05$), and no significant difference of IgM concentrations was found between the patients and healthy controls. When PBMCs from patients and healthy controls incubated with different membranes, Ig concentrations remained unchanged. All these data indicated that β_2M release from lymphocyte may be one of the causes for the increase of β_2M circulation in long-term HD patients besides declining of clearance capacity and redistribution of body fluid. Dialysers showed no stimulating effect on β_2M secretion, and on the contrary, some could suppress β_2M production. The capacity of lymphocyte to secrete IgG, IgA in uremic patients was significantly lower than those in healthy controls, which may be among the factors of immune deficiency in uremic patients.

Measurement of inactive plasma renin activity (IPRA) in the patients with hemodialysis. *Chen Zhongying, Lian Xiaomin and Dai Qinglin, Beijing Jiu Xian Qiao Hospital, China.* Total plasma renin activity (TPRA) and IPRA and angiotension II (Ang II) were examined with radioimmunoassay in 20 patients with hemodialysis and in 27 normal controls. The plasma levels of three patients were measured twice at the beginning and at the end of the hemodialysis. The average TPRA level was 5.47 ng/ml and IPRA 3.17 ng/ml, and AngII was 60.17 pg/ml in the normal controls. The average TPRA level in the 20 patients was 0.92 ng/ml and 0.21 ng/ml, IPRA 0.63 ng/ml and 0.17 ng/ml and AngII was 59.5 pg/ml and 21.5 pg/ml at the beginning of the hemodialysis and at the end of the hemodialysis, repectively. The plasma levels of TPRA and IPRA in the patients at the beginning of hemodialysis was lower than the controls, and AngII was the same. The TPRA and IPRA and AngII in the patients at the end of the hemodialysis were lower than at the beginning of the hemodialysis.

Circulating level of interleukin-6, TNF in patients with acetate-free hemodialysis. *Xiao Shen, Ji Dazi, Li Leishi and Hu Weixin, Institute of Nephrology, Jinling Hospital, Nanjing, China.* Growing interest has focused in recent years in the possible role of cytokines in the acute phase response of the inflammatory process and some authors reported that there is correlation between cytokines such as IL-1, IL-6, TNF, etc and acetate dialysate. In this study, we attempt to determine the relationship between IL-6, TNF, etc and the acetate dialysate. Twenty patients with end-stage renal failure including 12 long-term hemodialysis with acetate dialyste (AHD) and 8 long-term (more than 3 months) hemodialysis with acetate-free bicarbonate dialysate (AFBHD). Blood samples were obtained immediately before and after dialysis session and tested for plasma IL-6 and TNF using biological assays. The plasma IL-6 increased in 8 patients with AHD and 3 in FABHD. No changes were found in 4 patients with AHD and 5 in FABHD. In patients with AHD, TNF was significantly increased after the dialysis session ($P<0.05$) and unchanged with FABHD. From these results we can conclude that acetate-dialysate can stimulate the syntheais of the IL-6, TNF, so we highly recommend using FABHD instead of AHD in patients with chronic renal failure.

IL-1 production of peritoneal dialysis in patients with continuous ambulatory peritoneal dialysis. *Wang Xiali, Chen Xiangmei and Ji Xiaoning, Dept. of Nephrology, General Hospital of PLA, Beijing* 100853, *China.* Peritoneal dialysates in 19 patients with continuous ambulatory peritoneal dialysis (CAPD) were analysed with activated thymocyte by MTT incorporational method. The result showed that IL-1 level of peritoneal dialysates in the patients with peritonitis was higher than in the patients without peritonitis (0.348±0.088 vs 0.251±0.078, $P<0.05$); IL-1 of peritoneal dialysates in the aged with CAPD decreased distinctly (0.218±0.115 vs 0.267±0.051, $P<0.05$); and that in the patients with CAPD at 8:00 was reduced evidently when compared with that at 20:00. It was suggested that IL-1 level of peritoneal dialysates increased in the patients with peritonitis and the aged with CAPD or that at 20:00. are susceptible to peritonitis.

Evaluation of β2 MG by BK-PMMA membrane. *Liu Ping and Yang Shihong, Institute of Nephrology, Beijing Med. Univ, Wang Shaoting, Shi Hongqing, Zhang Fengbao and Zhang Guoliang, Institute of Biomedical Engineer, Tianjin Univ, China.* β2MG has been investigated as one of the determinants of carpal tunnel syndrome. The aim of this tudy is to investigate the effect of BK-PMMA membrane in removal of β2MG by clinical and theoretical experiments. 20 patients had been on MHD for 3.2 years on average. All patients were treated with BK-PMMA 1.0 dialyser. Blood samples from arterial and venous line of the dialyser and ultrafiltrated liquid were collected before, during and after dialysis, respectively. Serum β2MG was measured during interdialytic period in 5 patients. Theoretical experiment was based on simplified VVDP model. The results showed; (1) MHD patients on MHD, β2MG generation rate was 175.1−228.4 mg/d similar to the normal range (150−200 mg/d) and serum β2MG

levels were 10—30 times that of normals. (2) Mass transfer coefficient between compartments was 31.67±2.7 ml/min. Intercellular β2MG levels had no changes, suggesting that it is difficult to remove the intracellular β2MG deposition. (3) Each dialysis session serum β2MG concentration decreased by 23.2±6.5% ($P<0.05$). (4) During 30 mins, β2MG level in arterial line was much higher than in venous line, but very low in ultrafiltrate, suggesting that β2MG removed mainly by absorption of PMMA membrane. (5) At the end of dialysis session after 270 mins, arterial blood β2MG concentration fall significantly ($P<0.05$), β2MG concentration in venous blood and ultrafiltrate was higher than at 30 mins, this suggested that there was a filtration of β2MG beside the absorption. (6) During interdialytic period, blood β2 MG concentration increased gradually, at 48 hrs it almost reached the pre-dialytic level. Rebound of β2MG occurred. In conclusion, BK-PMMA membrane was effective in removal of β2MG mainly by adsorption first and then filtration.

Hepatitis virus infection in hemodialytic patients: 3-year serological investigation. *Cui Ruolan, Zhang Guozhao and Yang Xiaoyan, et al, Department of Nephrology, Changhai Hospital, Shanghai* 200433, *China.* Hepatitis virus infection in patients with long-term hemodialysis was investigated in this hospital. The investigation was carried out from 1990 to 1992. HBV infection rate was 30.8%, HCV was 39.2%, overlap infection rate was 8.7% and total infection rate 58.33% in 1990 ($N=23$). HAV infection rate was 0%, HBV 64.25%, HCV 80.7%, HDV 0%, HEV 19.35%, overlap 67.7%, and total infection rate was 96.8% in 1992 ($N=31$). The results suggested that hepatitis virus infection, especially HBV and HCV, was very high in hemodialytic patients with abnormal liver function. The relationship among hepatitis virus infection, blood transfusion and the hemodialysis factor were discussed.

Electrocardiogram monitoring during hemodialysis in the aged. *Wang Kai and Shi Liji, 402 Hospital, Beijing, China.* Cardiovascular diseases are the most common complications and the main cause of death in the aged patients with hemodialysis (HD). The electrocardiograms (ECGs) of 5 male and 6 female HD patients, aged 60—71 (64.5±3.5) years, were continuously monitored before, during and after HD for 41 times. Results: (1) ST-T changes occurred in 70.7% of patients, only 10.3% with the symptoms of angina pectoris; (2) 29.3% of patients had cardiac arrythmias among whom ventricular or atrial premature beats occurred in 12.2%, atrial fibrillation in 4.8%, tachycardia in 17.1%, and bradycardia in 2.4%; (3) ECG abnormalities were found in the first hour of HD in 78% patients; (4) ECG abnormalities disappeared in 4.9% of patients after stopping HD, and 75% of the ECG abnormalities could be ameliorated by proper treatment. We analysed the cause of the above findings and suggested that the following aspects are worth notice: (1) silent cardiac ischemia occurred frequently (89.7%) in the course of HD, and was often misdiagnosed. If HD continued, the injury of cardiac muscle could be worsened, even caused cardiac attacks. (2) Cardiac disorders occurred frequently within first hour of HD, so more attention should be paid to the first hour of HD. (3) Few cardiac complications could be managed timely, because it was often the aura of severe complications, such as shock, heart failure, etc. In conclusion, ECG monitoring may play an important role in the early diagnosis and proper treatment of cardiac complications.

Etiology, diagnosis and treatment of the aluminum intoxication in dialyzed patients with renal failure. *Wang Guanyu, Zhu Ping, Wang Suer, Shi Caiyu and Dong Dechang, Dept. of Nephrology, Rui Jin Hospital, Shanghai 2nd Medical University, Shanghai, China.* There was an intimate relationship between aluminum (AL) and chronic renal failure (CRF). AL intoxication was a potential danger to the uremic patients wether dialysed or not. We studied the changes of serum and bone AL levels in different types of patients with CRF. Desferrioxamine (DFO) test was done in 17 cases. The relationship among serum and bone AL contents and DFO test were analyzed as well. 7 patients with AL intoxication were treated with DFO. The results are reported in the Table (mean±SD).

	Controls	Azotemia	Uremia	HD	CAPD
Serum (μg/L)	11.22±5.61	20.87±6.61	22.58±7.03	56.76±20.2	39.77±18.5
Bone (mg/kg dry weight)	3.83±2.67			36.52±31.27	10.95±3.53

These results illustrated that AL levels of serum and bone in patients with CRF were significantly higher than normal persons and were also significantly higher in dialyzed patients. The serum AL levels was the highest in patients with maintenance hemodialysis on oral AL compounds, and it was increased 6-10 times that of controls. In HD patients using reversed osmosis water, the serum AL level did not increase markedly. It suggested that administration of AL compounds without proper water treatment was the main cause of AL intoxication. DFO test was positive in 9 of 17 patients using softened water. It was not related to serum AL levels, but to bone AL contents. Positive DFO test was present in AL load in tissues, which may be an auxiliary means for diagnosis of AL intoxication.

Six of 7 patients treated with DFO, DFO test turned into negative, the effective rate being about 85%. We have not observed any adverse reactions of DFO, except for slight headache in some individual patients.

In conclusion, AL intoxication showed no specific symptoms. Serum AL level can not reflect actual load of AL in the body. DFO test can help diagnose the AL intoxication, and DFO is also an effective and safe drug for treatment of AL intoxication.

Diagnosis and treatment of aluminum intoxication in regular hemodialysis patients. *Zhao Li, Du Xuehai, Zhang Ling and Fu Fangting, Dialysis Center, China-Japan Friendship Hospital, Beijing, China.* The aim of this study was to investigate the diagnosis and incidence of aluminum intoxication (AIT) in patients with regular hemodialysis (RHD) and the DFO treatment and to compare the efficacy of removal of aluminum-DFO-Complex (ADC) from the blood stream by Alukart absorption plus F 60 HD with F 60 HD alone.

Basic serum aluminum (BSA) levels were examined by atomic absorption spectrum in 111 RHD patients, among them DFO test was done in 93. Those whose BSA>200μg/L and/or DFO test positive were considered AIT and were treated by DFO infusion 5mg/kg twice a week. Alukart absorption plus HD with F 60 dialyzer for 2 hours (group A, $N=20$) and HD with F 60 dialyzer alone (group B, $N=10$) were used to remove ADC from the blood stream, and the removal percentage of ADC was compared between the 2 groups.

The results showed that; 1. The incidence of AIT of 111 patients was 31.5% (31 cases); 2. BSA>200μg/kg was found in 5 cases of dialysis encelopathy; 3. Symptoms of aluminum osteopathy (bone pain) were signficantly improved in 2 patients after DFO treatment; 4. The removal percentage of ADC treated by Alukart absorption plus HD with F 60 dialyzer (45.95% ±17.81%) was significantly higher than that of HD with F 60 dialyzer alone (28.37%±14.23%), ($P<0.01$).

Our data suggested that; 1. Incidence of AIT was very high in RHD patients; 2. DFO test is useful for the diagnosis of AIT; 3. Treatment of AIT by DFO along with absorption and/or HD is efficacious; and 4. Alukart absorption plus HD with F 60 dialyzer is better than HD with F 60 dialyzer alone for the removal of ADC from the blood stream.

Clinical research of heparin-free hemodialysis (absorptive method). *Wang Shufen, Du Juan and Li Jijun, et al, Department of Nephroloyg, 304th Hospital and Institute of Radiation Medicine, Beijing, China.* Hemodialysis can worsen some patients' condition because of the use of heparin, especially for patients with hemorrhagic trend. Heparin-free hemodialysis (HFHD) has become a very important research project in this area. In this study, HFHD was used for outpatients since November 1991 in our hospital. Eleven constant HD patients were chosen for HFHD randomly, (male 5, female 6, aged 34-70, HD duration; 0.5-41 months for a total of 45 times) including chronic glomerular nephritis 5, diabetic nephropathy 3, advanced cancer 2, and plycystic kindey 1. Nine of them had severe hemorrhage or hemorrhagic trend. 2. Baxter sps-550 and TORAY-321 EX type blood dialyzer and AKZO hemophan were used. Sodium heparin normal saline (200mg/1000ml) was perfused in the dialyzer before HD and circulated for 0.4h, then washed with 500ml NS for use. QB 200-250ml/min, QD 500 ml/min, HD time 4h. ACT, AcPA and VcPV, were monitored before and 1, 2, 4h after HD. VD, BUN and Scr were measured before and after HD and the eliminating rate of D was calculated. D coagulation was developed for 5 times within 45 times (11.1%). PA was raised mainly at D coagulation while at Ac and Vc coagulation PV mainly increased. The promoting factors for the development of coagulation in HFHD were fast velocity of blood perfusion, high osmotic liquid, and the insufficiensy of QB. The concentration curve of heparin in NS appeared before and after the absorption by HPLC. The heparin absorptive amount was 74mg/0.4h/0.9m D. Six points for the absorptive HFHD were suggested; (1) hemophan D, (2) sufficient preperfusion heparin NS, (3) monitoring of PA and PV in HD, (4) keeping water level upon the surface of blood, (5) avoiding the injection of blood and hyper-osmotic liquid into HD, and (6) sufficient QB. The absorptive method for HFHD showed preliminarily the advantages of safety, definite effect, good bio-concomitance, free from special medicine and equipment, not increasing the load of heart, simple to practise and high success

rate.

Experience on the clinical application of hemophan dialyzer (3000 times). *Wang Shufen, Li Jijun and Du Juan, et al, Department of Nephrology and Department of Nephrology and Department of Nuclear Medicine, 304th Hospital, Beijing, China.* We have performed dialysis using hemophan dialyzer since November 1991 for 3000 times. Clincial materials: Fourteen uremia patients were observed (10 male, 4 female; age: 28-65; HD time: 1-41 months), including chronic glomerular nephritis 11, chronic pyelonephritis 1, lupus nephritis 1 and polycystic kidney disease 1. The patients were divided into 2 groups. AK-ZO hemophan dialyzer was used in group A (10 cases, 95 times) and Baxter cuprophan dialyzer used for group B (4 cases, 45 times), BUN, SCr and B2-MG in blood were determined before and after dialysis for both groups. Results and discussion: The eliminating rate of BUN and Scr of group A was higher than group B ($P<0.001$, $P<0.01$). There was no significant difference in the eliminating rate of B2-MG between group A and B. The positive electric charge was brought on hemophan, so the heparin molecule can be absorped on hemophan, decreasing the opportunity of coagulation in the fibre tube. The principle used in our hospital to purify the blood was called heparin-free hemodialysis (HFHD absorptive method). Our experience demonstrated that hemophan dialyzer was better than cuprophan not only in the eliminating rate on small molecule toxin, but also in the times of repeated use. Because of the action of electric charge absorption, the permiablility of inorganic phosphate was intensified, increasing the eliminating rate of phosphate. The superfiltration coefficient was higher on hemophan, and the eliminating rate of water was stronger. It suggests that the eliminating ability of solute, bio-concomitance and the ability of superfiltrative dehydration of hemophan are better than cuprophan.

Estimation of dry-weight by measuring the bioelectrical resitivity in HD patients. *Jiang Feng, Bi Zengqi and Bo Yvhong, Peking Union Medical College Hospital, Beijing* 100730, *China* The assesment of dry-weight is one of the important problems for hemodialytic (HD) adequency clinically. We studied low-frequency resistivity of lower limb (ρ) and established its measuring method for HD patients.

In HD patients, post-HD ρ was higher than pre-HD (in man from 574 ± 24 to 483 ± 68, $P<0.05$, $N=25$, in woman from 617 ± 41 to 517 ± 79, $P<0.05$, $N=23$). There was a correlation between $\Delta\rho$ (ρpre-HD-ρpost HD) and UFV in HD patients ($r=0.8642$ for men, $P<0.05$ and $r=0.7003$ for women, $P<0.05$). For calculation of UFV, the equations $Vm=0.2048+0.03964\ \Delta\rho m$ were used for men and $Vf=0.1762+0.01768\ \Delta\rho f$ for women.

By compairing the methods of Br and cGMP (there was a correlation between ρ and cGMP), we came to the conclusion that: 1. ρ is a reasonable and reliable parameter for evaluating the dry-weight in HD patients. 2. The increase of post-HD ρ is significantly correlated with the decrease of EFV/Mass. 3. The expected ultrafiltrated volume can be predicted exactly and easily by the differences between pre-HD ρ and normal ρ.

Clinical evaluation of RBP determination in tubulointerstital diseases. *Fu Xiulan, Chen Nan, Feng Bai, Dong Dechang, Liu Guoming and Zhang Guisheng, Section of Nephrology, Rui Jin Hospital, Central Laboratory of Science and Technology, Shanghai Second Medical University, Shanghai, China.* Determination of urinary RBP and NAG in 94 patients with tubulointerstitial diseases (36 males and 58 females, mean age 51.5 years) and 100 control subjects (50 males and 50 females, mean age 47.5 years) showed that in proximal renal tubular damage, such as chronic pyclonephritis, gouty nephropathy, lupus nephritis, ARF, renal glycosaria and Fanconis Syndrome, the urinary RBP content is significantly higher in the patients, no matter how their renal functions are, than controls ($P<0.01$). The worse the renal function, the higher the excretion of urinary RBP. On the contrary, in type I RTA and nephrogenic diabetes imsipidus which are mainly distal renal tubular injury, urinary RBP is usually in normal range. For the tubulointerstitial diseases, increase of urinary RBP is more frequent than that of urinary NAG ($P<0.05$). In conclusion, the determination of urinary RBP has notable specificity and sensitivity for the diagnosis of tubulointerstitial diseases. The excretion of urinary RBP can reflect the degree of impairment of renal function and serve as an early index of renal damage in acute renal tubular nicrosis.

Proximal tubular function in neonates: prospective evaluation using urinary RBP concentrations. *Liu Guoming, Zhang Guisheng, Xu Zhenhua and Zhang Lan, Central Laboratory of Seience and Technology, Shanghai Second Medical University, Shanghai, China.* We developed an enzymeimmunoassay (EIA) for human urinary retinolbinding protein (RBP). Urinary concentrations of RBP and creatinine were measured serially in 60 healthy full-term infants, 20 preterm infants, 12 asphyxiated infants, and 50 healthy children (1—3 years). Urinary RBP concentrations in the full-term infants averaged 132.6 ± 131.0 μg/

mmol cr, the normal calculated upper limit (95% confidence) was 480.0 μg/mmol cr. Compared with the normal infants, the values were increased significantly (1065.5±1220.3 μg/mmol cr; $P<0.001$) in the preterm infants and significantly decreased (18.7±7.6 μg/mmol cr; $P<0.001$) in the healthy children. The equivalent values were significantly elevated in asphyxiated infants (1205.8±1340.9 μg/mmol cr; $P<0.001$). Levels exceeded the normal upper limit in 6 of 12 asphyxiated infants. These results suggest that urinary RBP can be used as a sensitive index for evaluating the renal tubular maturation in infants and for detecting proximal renal tubular injury associated with asphyxia in neonates.

Clinical significance of DAP IV in renal diseases. *Li Youji and Hao Wenke, Institute of Nephrology, the First Affiliated Hospital, Sun Yat-Sen University of Medical Sciences, Guangzhou, China.* The injury of tubulointerstitum is one of the important indicators to judge the prognosis of the renal diseases. Dipeptidyl aminopeptidase IV (DAP IV), located at the brush border surface of the proximal tubule, is important for the renal handling of peptides and proteins. We studied the DAP IV activity in patients with chronic glomerulonephritis, Lupus nephritis and in renal allograft to judge the relations between the urinary DAP IV activity and tubulointerstitial injuries. In order to account for variations due to urine concentration without collecting 24h specimens, a urinary DAP IV/urine creatinine ratio (DCR) was calculated.

Urinary DAP IV activity of healthy controls ($N=16$) was 1.90±0.45 U/L (DCR; 0.21±0.04 U/mmol Cr), and in patients with chronic glomerulonephritis or Lupus nephritis who have tubulointerstitial injuries proved by renal biopsy were significantly higher than that of patients without tubulointerstitial injuries. Urinary excretion of DAP IV was significantly ($P<0.05$) enhanced in renal allograft recipients in ten days after operation, but it decreased gradually. This decreasing tendency was paralled with serum creatinine ($r=0.90$, $P<0.01$).

Our results showed that elevation of urinary DAP IV activity in patients with chronic glomerulonephritis and Lupus nephritis could reflect the condititon of renal tubulointerstitial injuries. The determination of urinary DAP IV activity could be a useful, valuable and non-invasive early index to diagnose renal tubulointerstitial injury, and a useful test for judging the treatment and prognosis of diseases. We also speculated that urinary DAP IV activity was a sensitive indicator for monitoring the rejection episode.

Interleukin 8 in tubular cell proliferation and ATPase activity. *Zheng Feng, Li Leishi and Zhou Hong, Research Institute of Nephrology, Jinling Hospital, Nanjing, China.* In the past 5 years, tubular cells derived from the kidneys of a variety of species have been found to synthesize and secrete an increasing array of cytokines, including interleukin 8 (IL 8). It is likely that many of these factors act in an autocrine or paracrine fasion. This study was designed to observe the potential autocrine system related to IL 8. Recombined IL 8 at the final concentration ranging from 6.25 to 80 ng/ml was added to the culture medium of proximal tubular cells (PTC). The effects of IL 8 on the proliferation of PTC and on PTC expression of mRNA encoding growth factor TGF-β were investigated. Positive internal control derived from the house keeper gene, glyceraldehyde 3-phosphate dehydrogenase (GAPDH). ^{3}H-thymidine incorporation rate was not influenced by IL 8. mRNAs for TGF-β and GAPDH were not changed after the addition of IL 8. Platelet derived growth factor and epidermal growth factor are also able to regulate the cellular transport. We detected the calcium influx (^{45}Ca) and activities of Ca^{2+}-ATPase and Na^+-K^+-ATPase in PTC. Addition of 80 ng/ml of IL 8 resulted in significant increment of calcium influx ($N=6$, 34870.7±8272.6 cpm/well, v.s. control, $N=6$, 21794.5±9168.6 cpm/well, $P<0.05$) and Ca^{2+}-ATPase activity ($N=6$, 0.412±0.07 nmol. Pi/mg. pr/h, vs control, $N=6$, 0.321±0.08 nmol. Pi/mg. pr/h, $P<0.05$), while the activity of Na^+-K^+-ATPase was not modulated by IL 8. In conclusion, IL 8 is not a mitogen for PTC. The increment of calcium influx and Ca^{2+}-ATPase activity in PTC after the addition of IL 8, which were similar to those described in immune cells, suggested that these responses may serve as a signal transduction pathway in PTC.

Production of endothelin (ET-1) in kidney tubular cell (LLC-PK1) induced by extracellular matrix (ECM). *Chen Xiangmei, Yu Lifang and Zeng Qiang, General Hospital of PLA, Beijing, China.* LLCPK1 cell line was used to investigate the effect of ECM on production of ET-1 in cultured LLCPK1. Results and methods: (1) Fibronectin (FN), collagen IV and laminin were positive in cytoplasm of LLCPK1 by indirect immunofluorescence. (2) The expression of FN mRNA in LLCPK1 cell line was obviously proved through Northern hybridization. (3) LLCPK1 was cultured in 0.3% FCS or 10% FCS DMEM medium for 48 hours, ET-1 in the medium examined by radioimmunoassay was 47.7±0.819 pg/ml vs 70.69±1.77 pg/ml, $P<0.01$. (4) 1 μg/ml and 0.1 μg/ml FN collagen IV and laminin added to the culture media of LLCPK1 stim-

ulated production of ET-1 (Table).

ECM		ET-1	P
0.3%FCS(control)		47.71±0.81	
FN	1μg/ml	58.54±0.60	<0.01△
	0.1μg/ml	50.37±0.48	<0.001*
Collagen IV	1μg/ml	58.56±0.68	<0.01△
	0.1μg/ml	50.65±0.82	<0.01*
Laminin	1μg/ml	53.36±1.63	<0.01△
	0.1μg/ml	47.36±2.36	>0.05*

* vs control; △vs 0.1μg/ml

Conclusion: Our results suggest LLCPK1 cell line could secrete ET-1, which was regulated by ECM.

Three-dimensional reconstruction of EGF receptor and collagen IV of renal tubular cells and IL-8 mRNA expression in renal tubular cells. *Chen Xiangmei, Li Ninghong and Liao Hongjun, et al, Dept. of Nephrology, General Hospital of PLA, Beijing* 100853, *China.* Three-dimensional reconstruction after EGF receptors and collagen IV staining and IL-8 mRNA expressions of renal tubular cells were investigated by confocal laser scanning microscopy and reverse transcriptional PCR (RT-PCR). The result showed that 1. renal tubular cells cultured were identified using indirect immunofluorescence, cytokeratin and keratin were positive, but Factor VIII-related antigen was negative; 2. successful reconstruction of three-demensional view was completed by staining of mouse anti-human ECG receptor and collagen IV on or in renal tubular cells with confocal laser scanning microscopy; and 3. expressions of IL-8 mRNA of renal tubular cells were discovered with RT-PCR, for there was an obviously specific band at 289 bp. In conclusion, the special three-demensional constitution of renal tubular cells is demonstrated by anti-EGFR and collagen IV staining, and IL-8 mRNA can express in the renal tubular cells.

Effect of collagen I and endothelin-1 on the proliferation and the extracellular matrix by renal tubular epithelial cells. *Duan Yonggang and Chen Xiangmei, General Hospital of PLA, Beijing, China.* Renal tubular epithelial cells from human kidneys were cultured in vitro. The cells were identified by indirect immunofluorescence using keratin and cytokeratin. The epithelial cells were divided into three parts, collagen I (1%), endothelin-1 (1.33×10^{-9}) and normal and cultured for 8 days and then counted. Laminin, FN and collagen IV in the supernatant were assessed by ELISA. The cell counts decreased when the medium contained endothelin-1 [$(0.463\pm0.09)\times10^5$ vs $(1.56\pm0.13)\times10^5$, $P<0.01$]. The level of ECM is shown in the Table.

	Laminin	Collagen IV	FN
Control	0.819±0.019	0.241±0.004	0.933±0.042
Endothelin	0.826±0.019	0.257±0.006	1.069±0.026*
Collagen I	0.469±0.044*	0.253±0.006	1.026±0.018*

* $P<0.05$ vs control group

In conclusion, endothelin-1 can inhibit epithelial cell growth and collagen I may inhibit the secretion of laminin by epithelial cells. Endothelin and collagen I may promote the secretion of FN by epithelial cells.

Clinical and pathological analysis of interstitial nephritis. *Fan Minhua and Zou Wanzhong, Department of Nephrology, Department of Pathology, the Third Hospital of Beijing Medical University, Beijing, China.* Ten cases of interstitial nephritis from 300 renal biopsies over the past 3 years in our hospital were studied. The 10 patients 4 males and 6 females, aged 13—54 years. Clinical feature: nonsymptomatic proteinuria with/without renal dysfunction (7 cases), fever and hematuria (2 cases), diminishing of saliva with hypokalemia (1 case). Pathological feature: 6 cases were chronic interstitial nephritis. One case was due to pharmaceuticals (Ampicillin), 1 case was accompanied by mild mesangial proliferative IgA nephropathy, 1 case was secondary from myeloma, pathogenesis was unknown in 3 cases. 4 cases were acute interstitial nephritis; 2 accompanied with mild mesangial proliferative IgA nephropathy, 1 was secondary to Sjögren's syndrome, and 1 idiopathy. The main lesion was located in the renal interstitium. The acute pathological changes were diffuse edema of interstitium, the infiltration of lymphocyte and monocyte, and sometimes infiltration of plasma cell and eosinophilic leukocytes. The chronic changes showed obvious fibrosis with infiltration of lymphocyte, monocyte and plasma cell. The renal tubules had degeneration and atrophy. The glomerulus had no obvious changes. This group of patients had the following characteristics. 1. The dysfunction of different portions of tubule was found: nephropathy due to myeloma mainly affects the proximal tubule, and Sjögren's syndrome the distal tubule, resulting in the disorder of distal tubule and collecting tubule. Beta-lactamase enzymes antibiotics also influences the distal tubule. 2. All the interstitial damage was accompanied with the lesions of tubule in different degrees: the vacuolar degeneration of tubular epithelial cells, cast, atrophy and dilatation of tubule. So tubular-interstitial nephritis (TIN) is called. 3. 7 cases had a normal glomerulus and 3 mild changes, i.e. the damage of inter-

stitium is not secondary to the glomerulus change. 8 cases with renal dysfunction were due to severe damage of tubule and interstitium. 4. The pathogenesis of TIN was various: idiopathic TIN, TIN related to beta-lactamase enzymes antibiotics, Sjögren's syndrome complicated with TIN. Myeloma cast obstruction of tubule, or Bence-Jones protein has a direct toxicity on tubule.

Gene diagnosis of adult polycystic kidney disease by polymorphic microsatellite markers and PCR method. *Zhang Hong, Wang Haiyan, Zhu Shile, Liu Yuchun and Bai Qianfan, Institute of Nephrology, Beijing Medical University, Beijing 100034, China.* Genetic linkage analysis was available using linked restriction fragment length polymorphisms (RFLP) on both sides of the PKD1 in the adult polycystic kidney disease (APKD). But this technique is expensive and time-consuming. Polymorphic microsatellites, SM7, CKLH9 and KG8, are tightly linked with the PKD1. We combined PCR with polyacrylamide gel electrophoresis and the method of the gel Ag^+ staining to detect the alleles and genotype frequencies of these microsatellites amplified in unrelated Chinese population. The technique used is quite simple, fast, sensitive and does not require the use of radioisotopes and ultraviolet. Our studies showed that SM7, CKLH9 and KG8 observed 10, 9, 5 alleles respectively, their heterozygosity is same as the previous studies, but the distribution of the genotypes of CKLH9 and KG8 are different from the data pubilished abroad. About 50% unrelated individuals were the same genotypes. In the study of APKD families, only SM7 demonstrated the linkage relation with PKD1. So further studies should be done to approach whether these microsatellites can be used in the gene diagnosis of Chinese APKD families.

Endogenous digitalis-like factor in patients with chronic renal insufficiency, nephrotic syndrome and chronic glomerulonephritis. *Zhai Depei and Han Hongling, Department of Internal Medicine, Affiliated Hospital of Tianjin Medical University, Tianjin, China.* In order to detect if the plasma levels of endogenous digitalis-like factor (EDF) are affected by the renal diseases, to determine its relationship with Na pump and atrial natriuretic peptide (ANP), we measured plasma EDF in 131 patients with chronic renal insufficiency (CRI), nephrotic syndrome (NS) and chronic glomerulonephritis (CGN), and 67 normal subjects, and assessed erythrocyte Na-K-ATPase activity and plasma ANP levels in some of them.

As compared with normal controls (0.2070±0.0695 ng/ml), plasma EDF levels were significantly higher in CRI (0.2626±0.1033 ng/ml, $P<0.005$). Plasma EDF levels were lower in NS with normotensive (0.1761±0.0683 ng/ml, $P<0.05$) than that in controls. RBC Na pump activity tended to be lower in all patients, especially in patients with chronic renal insufficiency who were not on hemodialysis (CRINHD: 63.13±22.73 nmol/mg.h, controls: 179.75±60.21 nmol/mg.h, $P<0.0005$) and CGN (64.26±15.81 nmol/mg.h, $P<0.0005$). Plasma ANP concentrations were significantly increased in CRI (181.31±147.9 ng/ml, $P<0.05$), but there was no difference in NS and CGN with normal renal function (140.93±136.43 ng/ml) from controls (111.64±56.97 ng/ml). In CRI, plasma EDF levels were lower in CRIHD (0.2376±0.0939 ng/ml) than that in CRINHD (0.2826±0.1063 ng/ml, $P<0.05$); while RBC Na pump activity was significantly improved (CRIHD: 122.47±58.74 nmol/mg.h vs CRINHD, $P<0.005$). After HD, the plasma EDF levels were siginificantly decreased (after HD vs before HD: 0.1981±0.0649 ng/ml, 0.2675±0.0719 ng/ml, $P<0.05$). There was no correlation between plasma EDF and Scr in CRINHD. There was an inverse correlation between RBC Na pump activity and Scr in CRINHD, $r=-0.532$, $P<0.05$. In NS, plasma EDF levels were significantly correlated with both the amount of 24h proteinuria and mean arterial pressure. Plasma EDF levels were strongly inverse-correlated with RBC Na pump activity in CGN and moderate CRI (Scr<442 μmol/L), $r=-0.828$, $P<0.0005$. Plasma EDF levels were significantly correlated with plasma ANP levels whenever the renal function is normal or insufficient, $r=0.536$, $P<0.005$.

In conclusion, EDF is a water and sodium metabolist regulator which is closely related with blood volume and arterial pressure. Plasma EDF concentrations are increased in patients with CRI, CGN and some of NS. EDF may remove the excessive fluid and maintain the water balance in the body. It may play a role in the pathogenesis of hypertension in uremic patients. The decrease in plasma EDF levels may be another factor of heavy edema in NS. In CGN, increased plasma EDF may play a role in the pathogenesis of progressive reduction of renal function. By hemodialysis, plasma EDF is decreased while Na pump activity is increased. In some cases there is no correlation between plasma EDF levels and Na pump activity, which may be caused by some other factors. RBC Na pump activity is lower in all patients, and the more renal function reduced the more Na pump activity decreased. In our patients, there is a positive correlation between the plasma EDF and ANP.

Effects of hemodialysis on interleukin-2 gene expression.

Xing Changying and Wang Xiaoyun, Department of Nephrology, The First Affiliated Hospital of Nanjing Medical University, Nanjing, China. This study was designed to detect interleukin-2 (IL-2) gene expression (IL-2 mRNA) with a digoxigenin (DIG)-labeled cDNA probe of human IL-2 mRNA in blood lymphocytes deposited on subbed slides. Alkaline phosphatase (AP) linked anti-DIG antibody, the nitro blue tetrasolium/5-bromo-4-chloro-3-indolylphosphate (NBT/BCIP) were used to detect DIG. The image was obtained by general microscopy. Lymphocytes secreting IL-2 were detected with mouse mono-clonal anti-human IL-2 antibodies and AP-anti-AP-antibody complex. The results were that IL-2 mRNA and IL-2 positive lymphocytes in patients treated with hemodialysis (HD) before HD, patients of end-stage renal failure (ESRF) and primary glomerular diseases, and normal control group were similar, but HD with cuprophane membrane dialyzers increased IL-2 gene expression and synthesis of IL-2 protein ($P<0.05$).